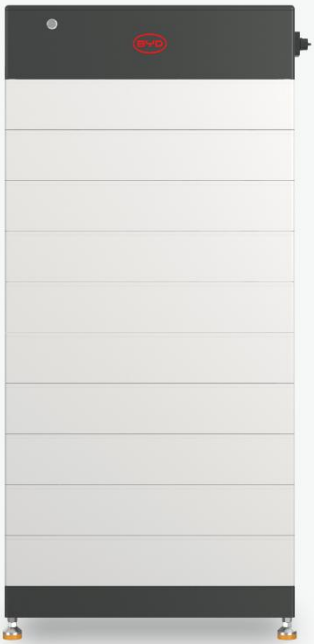
EN-Manual

Sept.-2025 Version1.2



High Voltage Battery System

Battery-Box

HVB 5.9, 8.9, 11.8, 14.8, 17.8, 20.7, 23.7, 26.7, 29.6

User Manual

iOS

Android

Copyright©2023 BYD Co., Ltd. All Rights Reserved.

Legal Provisions

All information in this document is the property of BYD Lithium Battery Co.,Ltd.(herein after **“BYD"**) and no part of this document may be reproduced in any manner for commercial use.

BYD makes no representations or warranties, express or implied, with respect to this document or any equipment and/or software that may be described in it, including (without limitation) any implied warranties of utility, merchantability or fitness for any particular purpose, and all such representations or warranties are expressly disclaimed. In no event shall BYD or its distributors or dealers be liable for any indirect, incidental or consequential damages.

Under some statutes, the exclusion of implied warranties may not apply in all cases, so the above exclusion may not apply.

This document does not supersede and is not intended to supersede any local, state, provincial, federal, or national laws, regulations, or codes applicable to the installation, electrical safety, and use of the battery module. BYD is not responsible for compliance or non-compliance with such laws or regulations when installing the battery module.

Specifications are subject to change without notice. Every effort has been made to keep this document complete, accurate and current. However, without advance notice, BYD may need to make some improvements in specific situations. BYD shall not be liable for any damage caused by this document, including but not limited to omissions, errors, typographical errors, miscalculations, or tabulation errors in this document.

Limited Warranty Letter

You can download the latest warranty documents from the www.bydenergy.com on the Internet.

Product Datasheet

You can download the latest product datasheet from the www.bydenergy.com on the Internet.

Compatible Inverter List

You can download the latest Compatible Inverter List from the www.bydenergy.com on the Internet.

Service Guide and Checklist

You can download the latest Service Guide from a www.bydenergy.com on the Internet.

BYD Lithium Battery Co.,Ltd.

No.3001 Baohe Road, Baolong, industrialCity, Longgang, Street, Longgang District, ShenZhen.

Manufacturer

Shanwei BYD Auto Co., Ltd.

Xinhe Industrial Park, Luhe, Shanwei, P.R.China.

Table of Contents

1 Information on this Document **6**
1.1 Validity **7**
1.2 Target Groups **7**
1.3 Content and Structure of this Document **7**
1.4 Loading and Unloading Requirements **7**
1.5 Transport requirements **7**
1.6 Declaration of Conformity **8**
1.7 Warning Level **8**
1.8 Documentation Symbols **8**
1.9 Abbreviations and Definitions of Terms **9**
2 Security **10**
2.1 Intended Use **10**
2.2 Important safety instructions **11**
2.2.1 Battery Module Leakage 11
2.2.2 Firefighting Measures 12
2.2.3 Battery Modules Handling and Storage Guide 12
2.2.4 Warning of Electric Shock 13
2.2.5 Warning of Overvoltages 13
2.2.6 Caution of Weight 14
2.2.7 Property Loss Notification 14
3 Scope of Delivery **15**
3.1. BCU and Base Package **15**
3.2. Battery Module Package **16**
4 Battery System Overview **17**
4.1 Structure Dimension Drawing **17**
4.2 Battery System Description **17**
4.3 Battery System Scalability **18**
4.4 Interface **19**
4.5 Symbols on the System **21**
4.6 Nameplate Label **23**
4.6.1 BCU Labels 23
4.6.2 Battery Module Labels 23
4.7 LED Signals **24**
5 Installation **25**

5.1 Requirements for Installation **25**
5.1.1 Requirements for Installation Location 25
5.1.2 Tools & Additional Accessories (not included in the scope of delivery) 26
5.1.3 Safety Gear & Required Personnel 26
5.2 Pre-Installation Checking **27**
5.3 Floor Installation **28**
6 Electrical Connection **31**
6.1 Overview of the Connection Area **31**
6.2 Connection Diagram **32**
6.2.1 Single Tower 32
6.2.2 Multiple Towers 33
6.3 Connecting the Grounding Conductor **34**
6.4 Data Cable Connection **35**
6.4.1 Inverter Cable Connection between Inverter and One Battery System 35
6.4.2 Data Cable Connection between Parallel Battery System 38
6.5 DC Connection **39**
6.6 BYD Smart WiFi/LAN Module Installation **42**
6.6.1 Inverters + HVB 42
6.6.2 Installation Procedure 43
6.6.3 Connect the Smart WiFi/LAN Module to the BCU 43
7 Commissioning **46**
7.1 Switch on the Battery System **46**
7.2 Configuration of battery system **47**
7.3 Switch on and Commission the Inverter **47**
7.3.1 On Grid Applications 47
7.3.2 Off Grid Applications 48
8 Operation **49**
8.1 Switch on Battery System **49**
8.1.1 On Grid Applications 49
8.1.2 Off Grid Applications 50
8.2 Shut Down the Battery System **51**
8.3 Safety Design **52**
8.4 Protective Devices **52**
9 Disassembly **53**
10 Capacity Expansion **54**
11 Fault Guide **55**
11.1 LED Failure Indication **55**

11.2 Service Guide 55
12 Storage 56
13 Maintenance and Replacement 57
14 Disposal of Battery System 58
15 Technical Parameters 59
16 Contact Information 63
Appendix Connection Options with Inverters 64

1 Information on this Document

Disclaimer

When installing, operating, and maintaining the equipment, read this manual first and follow all safety precautions in the equipment and manual.

BYD shall not be liable for any of the following circumstances.

- Do not operate under the conditions described in this manual.
- The installation and use environment does not comply with relevant international, national or regional standards.
- Unauthorized disassembly, alteration of the product or modification of the software code.
- Not following the safety instructions and precautions in the product and manual.
- Damage caused by abnormal natural environment (force majeure, such as earthquake, fire, wind, flood, mudslide, etc.).
- Losses due to customer transportation.
- Damage due to storage conditions not meeting the requirements of this manual.
- Hardware or data damage due to negligence, mishandling, or intentional damage by the customer.
- System damage caused by third parties or customers, including damage caused by improper transportation and installation that does not meet the requirements of this manual, and damage caused by adjustment, alteration, or removal of identification marks that do not meet the requirements of this manual.

* Reverse engineering, decompilation, disassembly, adaptation, implantation, or other derivative operations of the device software are prohibited. It is forbidden to study the internal implementation of the device, obtain the source code of the device software and steal intellectual property rights in any way. It is forbidden to disclose any performance test results of the equipment software.

1.1 Validity

This document is valid for the Battery-Box HVB 5.9, 8.9, 11.8, 14.8, 17.8, 20.7, 23.7, 26.7, 29.6.

1.2 Target Groups

Instructions in this document may only be performed by qualified personnel with 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
- Trained in dealing with the hazards associated with the installation and operation of electrical equipment and batteries
- Trained in the installation and commissioning of electrical equipment
- Failure to do so will void any manufacturer's warranty, guarantee, or liability 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 system overview, installation, electrical connection, commissioning, operation, decommissioning, expansion, troubleshooting, maintenance and storage, battery module disposal, technical parameters and contact information. Read this document before performing any action on the battery system.

1.4 Loading and Unloading Requirements

Batteries need to be handled in accordance with local laws, regulations and industry standards. Improper loading and unloading can result in shorting or damage to the battery, which can lead to leakage, rupture, explosion, or fire.

1.5 Transport requirements

- Before shipment, the battery must be checked to ensure that it is intact and free from unusual odors, smoke, fire, etc. Otherwise, shipment is prohibited.

- Packing must be secure. The product must be handled with care during transportation, and moisture-proof measures shall be taken. Considering the influence of external environment (such as temperature, transportation, storage, etc.), the specifications and parameters shall be subject to the date of manufacture.
- The following conditions must be prohibited during transportation: direct contact with rain, snow or immersion in water; falling or mechanical shock; Inverted or tilted.

1.6 Declaration of Conformity

The battery system described in this document comply with applicable local directives. The certificate is available in the Downloads area of the www.bydenergy.com.

1.7 Warning Level

The following levels of warning messages may appear when handling the battery system

DANGER

Indicates a hazardous situation that, 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 that could result in property damage if not avoided.

1.8 Documentation Symbols

QUALIFIED PERSON

Describe activities performed by qualified personnel only.

1.9 Abbreviations and Definitions of Terms

No.	Designation	Explanation
1	HVB	BYD Battery-Box HVB
2	BCU	Battery Control Unit
3	BIC	Battery Information Collector
4	BMS	Battery Management System
5	BYD	BYD Lithium Battery Co., Ltd.
6	SOC	State of Charge
7	Smart WiFi/LAN Module	For detailed operation, please refer to the Quick Guide of the Smart WiFi/LAN Module

2 Security

Disclaimer

BYD shall not be liable for any functional failure, component damage, personal safety accident or property loss caused by the following reasons:

- The customer fails to charge the battery in time, resulting in loss of battery capacity or other irreversible damage.
- Falling, leaking or other damage caused by improper handling or connection.
- The user does not set the battery operation management parameters correctly.
- The customer or third party changes the battery usage scenario without consulting BYD.
- Mix the batteries provided by BYD with other batteries, including but not limited to: mixing with batteries of other brands, mixing with batteries of different rated capacities, etc.
- The working environment or external power supply parameters can not meet the requirements of the normal working environment, causing direct damage to the battery.
- The customer has not properly maintained the battery in accordance with the owner's manual.
- Out of warranty batteries.
- Battery damage due to the use of an inverter other than in the configuration list (Technical Information).
- Use accessories without recommended specifications.

2.1 Intended Use

Battery-Box HVB works with photovoltaic systems for residential use. It is a high-voltage lithium-ion battery storage system with a control module that can operate in on grid, off grid and on grid + backup modes via compatible inverter.

The battery system can be connected to the Internet and firmware updates via Smart WiFi/LAN Module.

The battery system can only be used as a fixed device.

The battery system is suitable for indoor and outdoor use under the conditions described in Section 5.1.

Battery system can only be used with the compatible inverters. A list of these inverters (BYD Battery-Box HVB&HVM+&HVS+ Compatible Inverter List) can be found in the www.bydenergy.com.

The battery system is not suitable for:

- Powering life-sustaining medical equipment and location near medical equipment;
- Train, elevator and other control equipment may cause personal injury;
- Computer systems of social and public importance;
- Equipment similar to that described above.

Alterations, such as alterations or modifications, to the battery are not permitted unless written permission is obtained from BYD. Unauthorized changes will invalidate warranty and warranty claims.

BYD shall not be liable for any damage caused by such changes. The type label should always be attached to the battery system.

2.2 Important safety instructions

The battery system is designed and tested to meet international safety requirements. However, to prevent personal injury and property damage and to ensure long-term operation of the battery system, please read this section carefully and always observe all safety information.

2.2.1 Battery Module Leakage

If the battery module leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and may cause skin irritation and chemical burns on contact. If you come in contact with leaking material, perform the following steps:

Accidental inhalation: Evacuate the contaminated area and seek medical attention immediately.
Eye exposure: Rinse eyes with running water for 15 minutes and seek immediate medical attention.
Skin contact: Wash the affected area thoroughly with soap and water and get medical help immediately.
Ingestion: Induce vomiting and seek medical help immediately.

2.2.2 Firefighting Measures

When the battery module is put into a fire, the battery module may catch fire. In the event of a fire, make sure there is an ABC or CO_2 fire extinguisher nearby. Do not use water to extinguish the fire. Firefighters need to wear full protective clothing and self-contained breathing apparatus when fighting fires.

2.2.3 Battery Modules Handling and Storage Guide

The battery module and its components shall be protected from damage during transportation and handling.

- Do not hit, pull, or step on the battery module.
- Do not insert extraneous objects into any part of the battery module.
- Do not place the battery module in a fire.
- Do not immerse the battery module in water or seawater.
- Do not handle strong oxidizing agents.
- 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 in the sun.
- The battery module cannot be stored in a high humidity environment.
- Do not use the battery modules if they are defective, or appears cracked, broken or otherwise damaged, or fail to operate.
- Do not attempt to open, disassemble, repair, tamper with, or modify the battery modules. The battery modules are not user-serviceable.
- Do not use cleaning solvents to clean the battery modules.

2.2.4 Warning of Electric Shock

DANGER

Danger to life due to electric shock when live components or power cables are touched

The power cables connected to an inverter may be live. Touching live power cables results in death or serious injury due to electric shock.

- Disconnect the battery system and inverter from the voltage source and make sure that they cannot be reconnected before operating the equipment.
- Do not touch non-insulated parts or cables.
- Do not remove the terminal block with the connected power wire from the slot under load.
- Wear appropriate personal protective equipment when performing all work on the battery system.
- Comply with all safety information from the inverter manufacturer.

2.2.5 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 and inverters in the same network are integrated into the existing surge protection.
- When laying network cables or other data cables outdoors, it must be ensured that a suitable surge protection device is provided at the transition point of the cable from the outdoor battery system or inverter to the interior of the building.

2.2.6 Caution of Weight

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.

- Carefully transport and lift the battery module. Consider the weight of the battery module.
- Wear appropriate personal protective equipment when performing all work on the battery system.

2.2.7 Property Loss Notification

NOTICE

Damage to the BCU due to sand, dust and moisture ingress

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

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

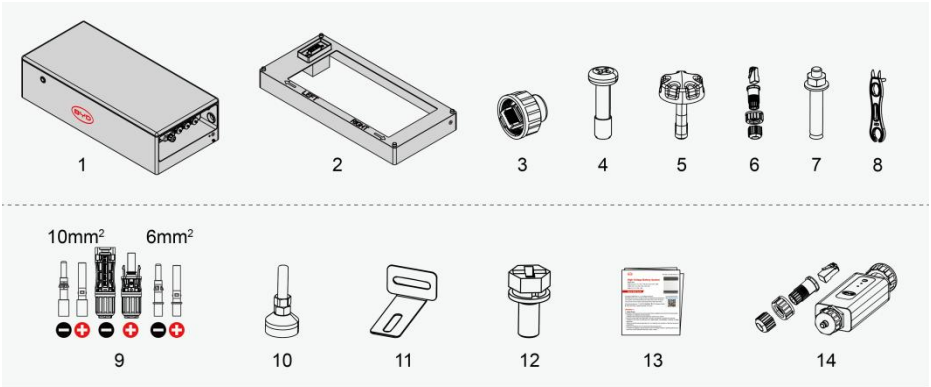
NOTICE

Damage to the battery system due to under voltages

- If the battery system does not start at all, please contact BYD's local after-sales service team within 48 hours. Otherwise, the battery may be permanently damaged.

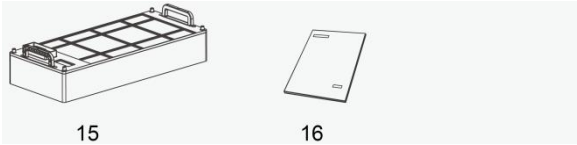
3 Scope of Delivery

3.1. BCU and Base Package



Position	Quantity	Designation
1	1	BCU
2	1	Base
3	1	Terminal resistor
4	2	Screw M4*14 for Main Switch（Outdoor）
5	2	Knob screw for Main Switch（Indoor）
6	2	Communication terminal for two or three battery systems in parallel
7	2	Expansion screw M8 for Hanger
8	1	Connector special tool for Power cable connector
9	2	Power cable connector for BCU
10	4	Adjustable foot for Base
11	2	Hanger for BCU
12	2	Screw M5*16 for BCU
13	1	Quick Start Guide
14	1	Smart WiFi/ LAN Module

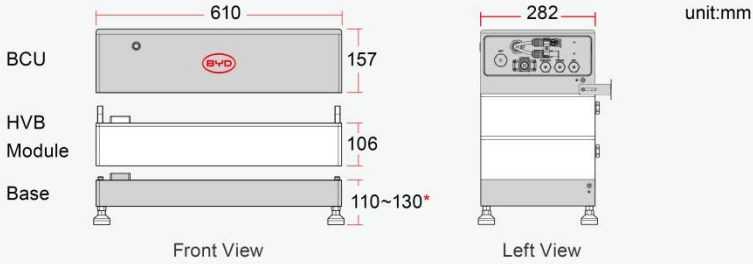
3.2. Battery Module Package



Position	Quantity	Designation
15	1	HVB Module
16	2	Attached document

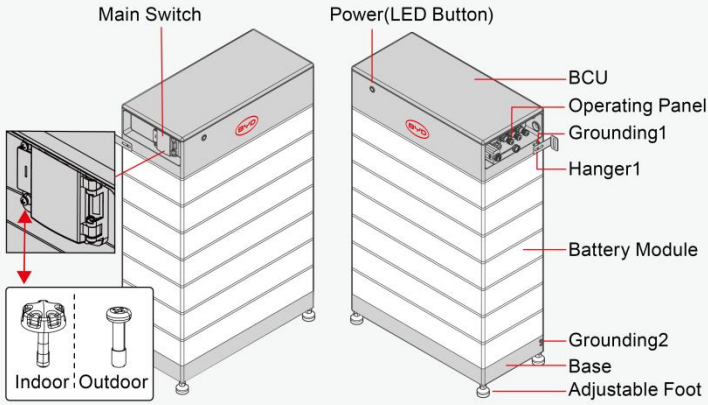
4 Battery System Overview

4.1 Structure Dimension Drawing



*The four feet of the base support adjustment within a height range of 110-130mm to adapt to possible tilts of the ground.

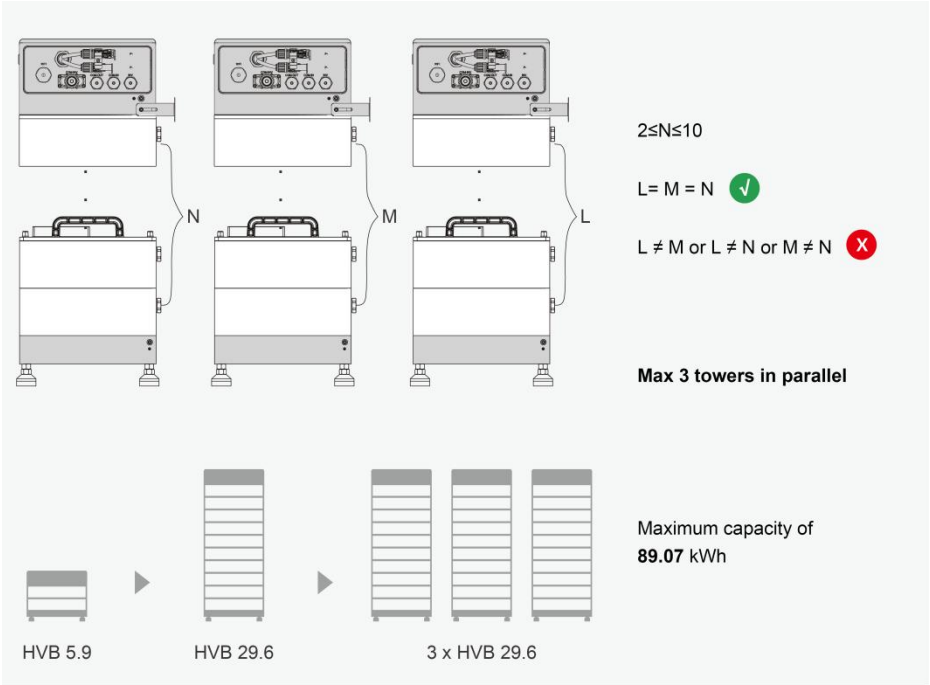
4.2 Battery System Description



*Notice：

the Screw M4*14 for Main Switch in Outdoor, the Knob screw for Main Switch in indoor.

4.3 Battery System Scalability



4.4 Interface

BYD Energy

BYD Energy is an app for Android and iOS system devices which can be downloaded from Google Play or App Store.Through the APP, you can realize intelligent battery management, including remote data monitoring, firmware upgrade and troubleshooting.

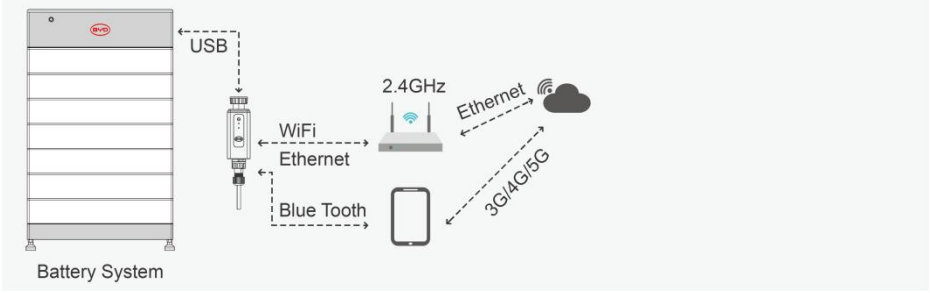
- **Android users**: Search for “**BYD Energy**" on Google Play or scan Android QR code to download and install.
- **iPhone users** : Search for “**BYD Energy**” in the App Store or scan iOS QR code to download and install.

Android iOS

Configuration steps:



The battery system doesn't have a wireless communication function. Through the USB, the battery system supports the expansion of connection with the Smart WiFi/LAN Module to implement the wireless function, and the Smart WiFi/ LAN Module had obtained individual cyber security certification in accordance with EN 18031 series.



For detailed configuration steps, please refer to the App user manual.

Website: www.bydenergy.com.

Scan the QR code below to obtain the corresponding video manual.

4.5 Symbols on the System

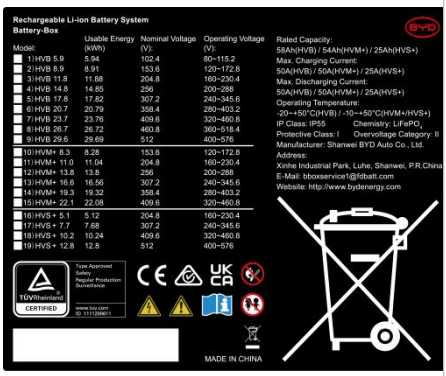
Symbol	Explanation
	**Observe the documents** Observe all documents supplied with the system.
	**Separate collection symbol** Do not dispose of used batteries with other waste. Instead, collect and recycle them separately in accordance with Regulation (EU) 2023/1542.
	**Separate collection symbol (WEEE)** 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.**

	RCM (Regulatory Compliance Mark) The system complies with the brief guide to electrical equipment approvals in Australia.
	The product has been tested and certified by TUV Rheinland.
	UKCA marking The product complies with the regulations of the applicable laws of England, Wales and Scotland.

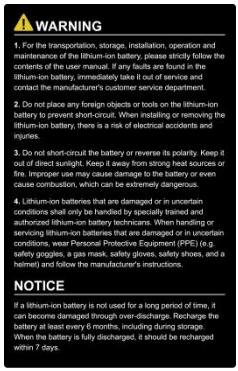
4.6 Nameplate Label

4.6.1 BCU Labels

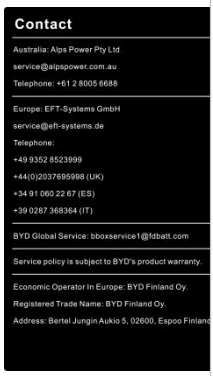
BCU Nameplate



Warning Lable

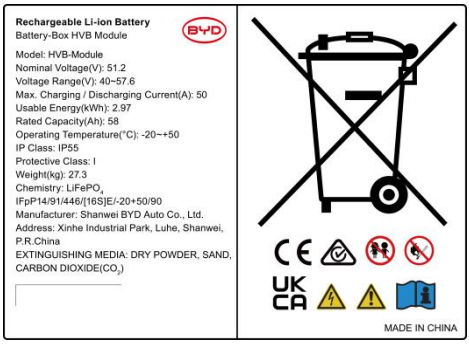


Contact Lable

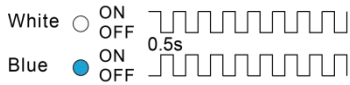
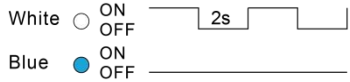
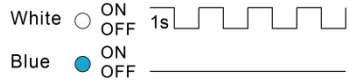
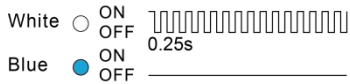
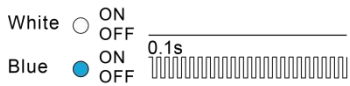


4.6.2 Battery Module Labels

HVB Module Nameplate



4.7 LED Signals

Indicator	Status	Description
Flashing white and blue alternatively		The battery system is initiating
Flashing white slowly		The battery system is charging
Flashing white		The battery system is discharging
Constant white		Idle (the battery system is either charging nor discharging).
Flashing white fairly quickly		Black start function
Flashing white quickly		The battery system is updating software
Flashing blue quickly		Exit system

The specific logic of LED lights can be found in the Service Guideline and Checklist.

5 Installation

5.1 Requirements for Installation

5.1.1 Requirements for Installation Location

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

b) The installation location must be inaccessible to children.

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

d) The installation location must not be exposed to direct solar irradiation, rainwater and snow.

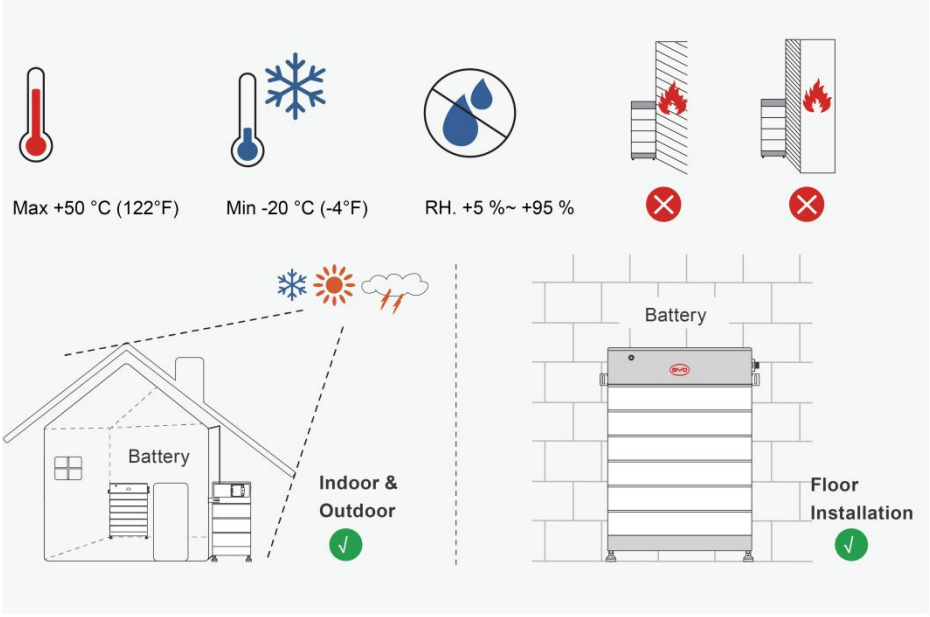
e) The horizontal level of the installation site shall be above the highest water level of that area in history and at least 300 mm above the ground. The installation site must not be located in a low-lying land.

f) The installation location must not be close to the heat sources.

g) The altitude of the installation location should be less than 3000 m.

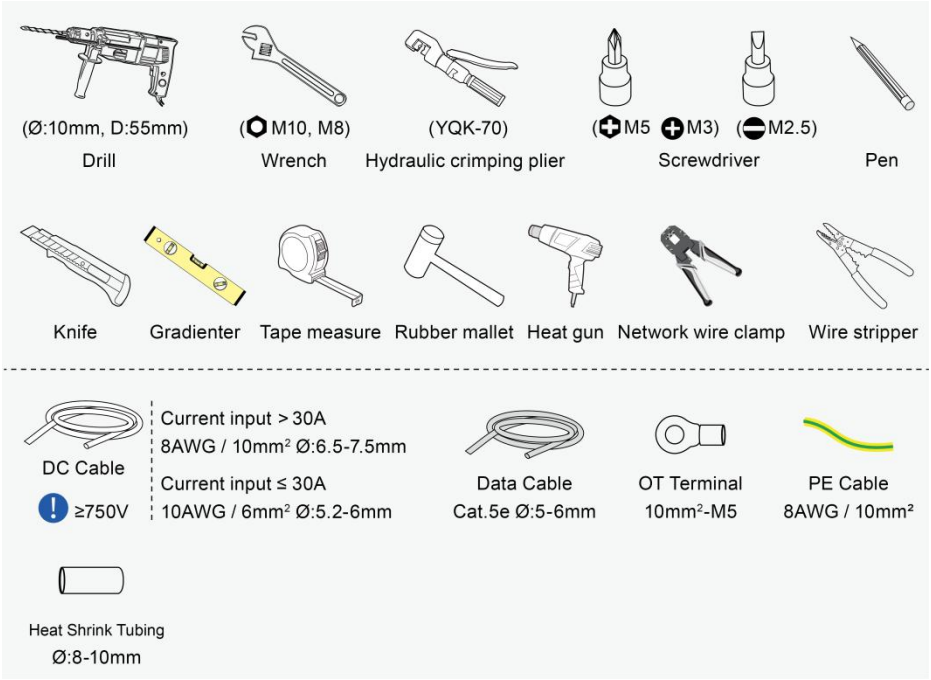
h) The ambient temperature should be between -20 °C and +50 °C.

i) The ambient humidity should be between 5-95% (non-condensing).



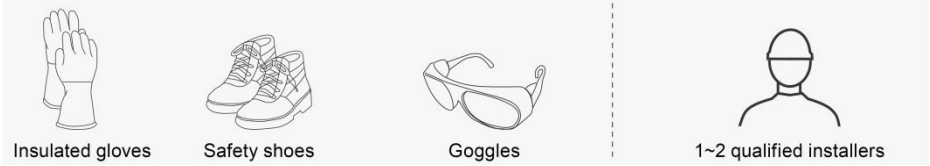
5.1.2 Tools & Additional Accessories (not included in the scope of delivery)

You may need to use the tools in the following table during the installation process.



The Cat.7 data cable is required for connection to the Kostal inverter.

5.1.3 Safety Gear & Required Personnel



5.2 Pre-Installation Checking

QUALIFIED PERSON

DANGER

Danger to life from electric shock due to live power cables or connectors at the battery system

The power cables connected to the battery system may be live. Touching the power conductors or the live components leads to lethal electric shocks.

- Do not touch non-insulated cable ends.

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.

- Carefully transport and lift the battery module. Consider the weight of the battery module.
- Wear appropriate personal protective equipment when performing all work on the battery module.work on the battery system.

Inspection before installation:

Product packaging: Before removing the energy storage packaging, inspect the packaging for visible damage, such as holes, cracks, or other internal Signs of possible damage, and check the energy storage model.If there is any abnormal packaging or the energy storage model does not match, do not open it and contact your dealer as soon as possible.

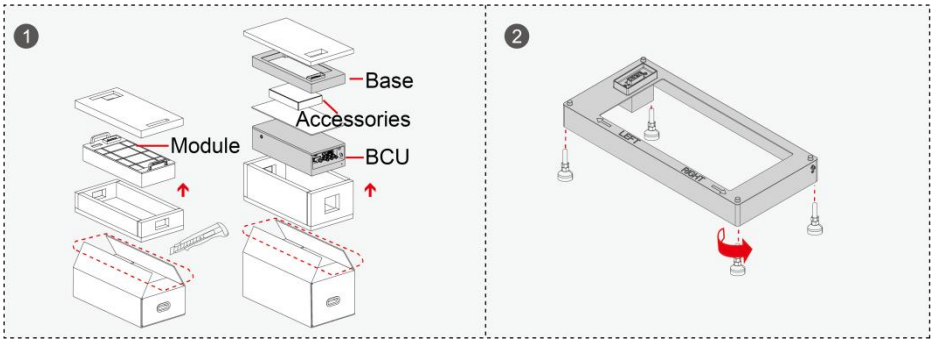
Inspection of deliverables: After unpacking the energy storage overpack, check the deliverables for completeness and for any visible external damage.If any items are missing or if there is any damage, contact your dealer.

5.3 Floor Installation

Procedure:

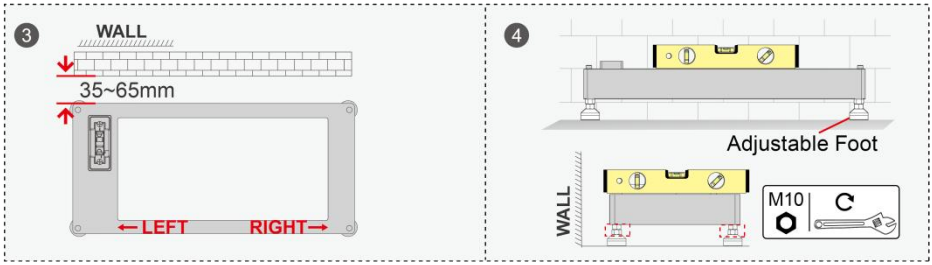
1. Open the box and remove the accessories, Base and BCU.

2. Install the feet to the base.



3. Please follow the **LEFT** and **RIGHT** markings on the base, put the base along the wall, and keep a distance of 35~65mm.

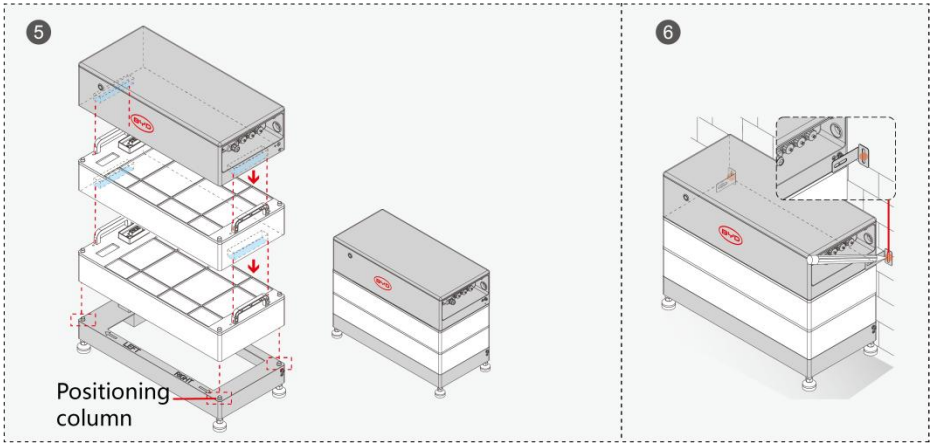
4. Adjust the feet to ensure that the battery remains horizontal (**Tilt is not allowed!**).



5. Install the battery modules on the base first, then stack the battery modules one by one, and finally install the BCU on the top of the battery module.

There is electricity in the blind socket, please do not touch it!

6. Mark the position of the drill holes with the hanger1.

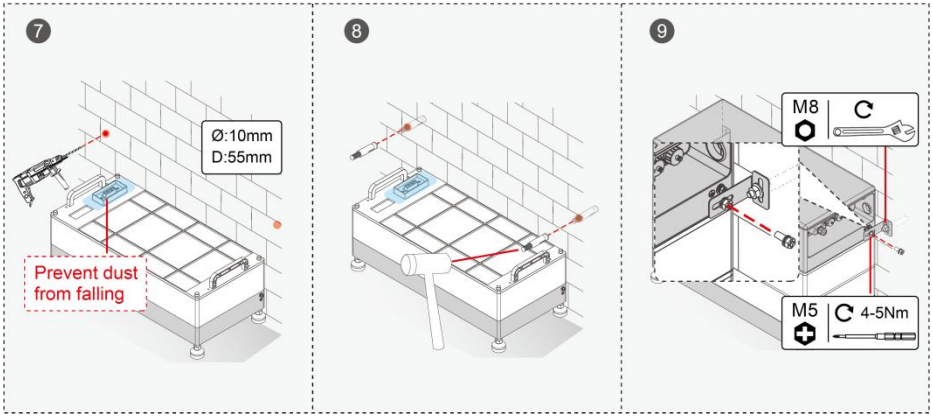


7. Move the BCU aside and then drill holes at the marked locations.

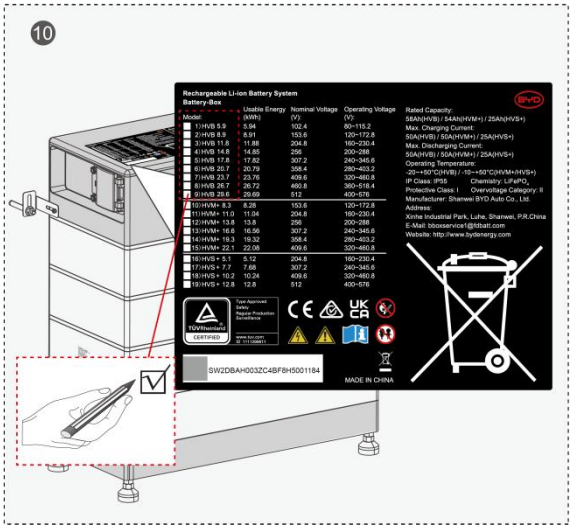
Please cover the blind socket to avoid falling dust.!

8. Hammer the two expansion screws into the holes with a rubber mallet, loosen the screw part of the expansion screw and remove it.

9. Move the BCU to the initial position to make the mounting holes of th e foot piers are aligned with the drilled holes, and then tighten the screws.



10. Mark the product type.



Model	Number of Modules
HVB 5.9	2
HVB 8.9	3
HVB 11.8	4
HVB 14.8	5
HVB 17.8	6
HVB 20.7	7
HVB 23.7	8
HVB 26.7	9
HVB 29.6	10

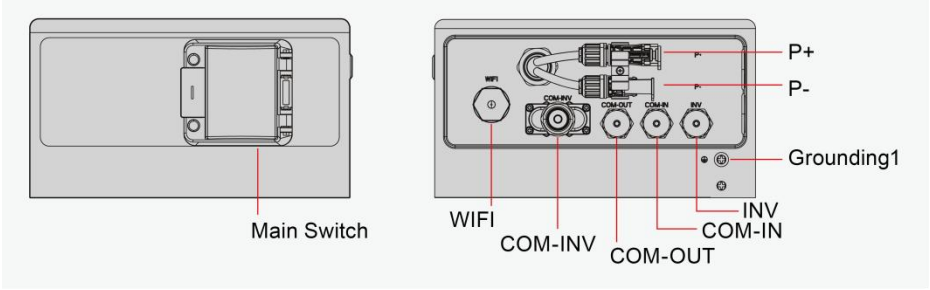
NOTICE

Damage to the battery system due to under voltages

- If the battery is installed, it should be set into operation within a month, or checked regularly, otherwise there might be damage to the batteries.

6 Electrical Connection

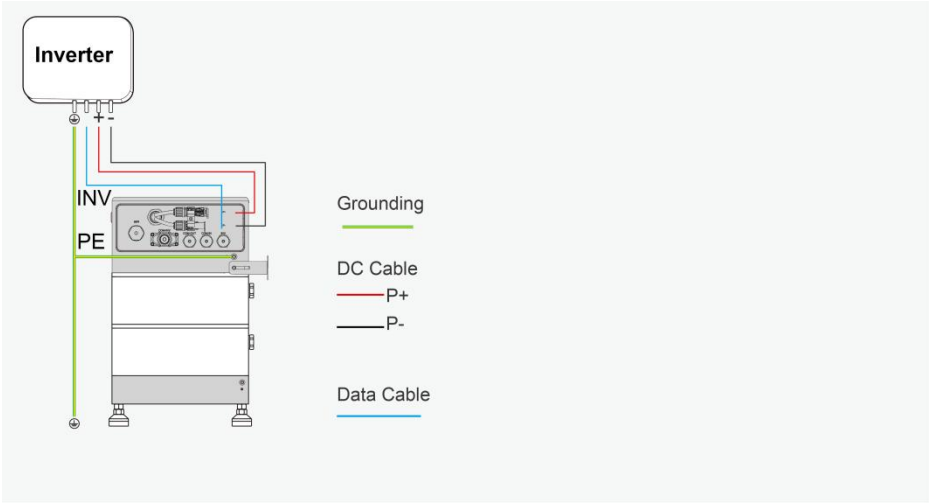
6.1 Overview of the Connection Area



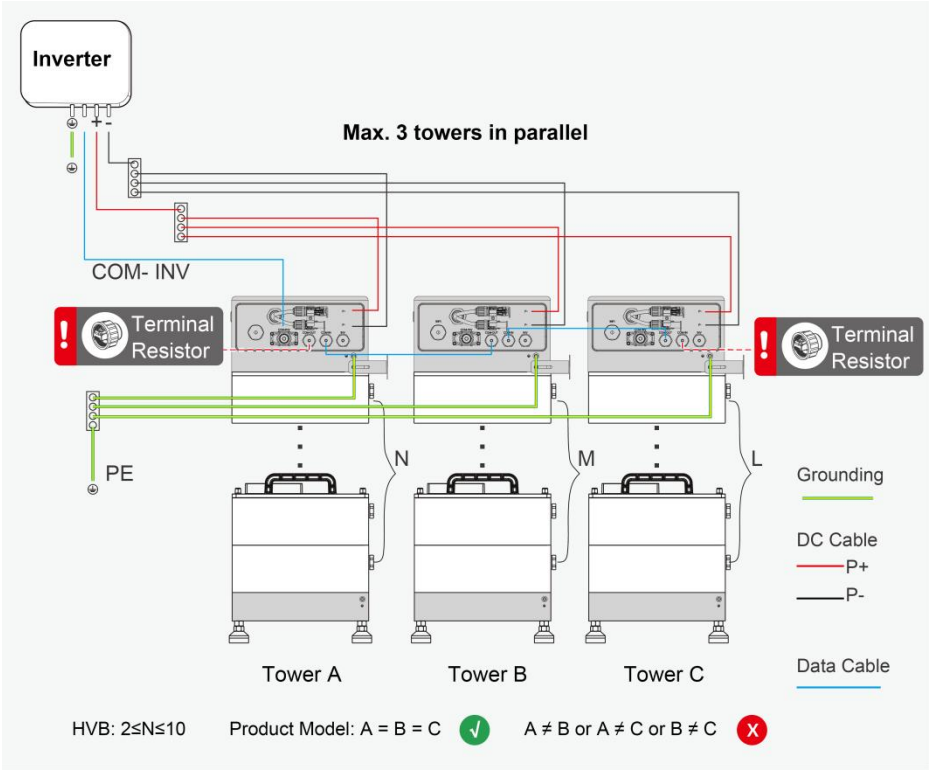
Terms	Description
WIFI	Port for smart WIFI/LAN module.
COM - INV	Port for data cable in, for inverter connection.
COM - OUT	Port for data cable out, for battery parallel connection.
COM - IN	Port for data cable in, for battery parallel connection.
INV	Port for data cable in, for inverter connection.
Grounding	Grounding connection.
P+	Connect to positive terminal of inverter.
P-	Connect to negative terminal of inverter.
MAIN Switch	Power on/power off.

6.2 Connection Diagram

6.2.1 Single Tower



6.2.2 Multiple Towers



Only one type of battery module can be used in the same tower!

When two or three battery systems work in parallel, terminal resistors must be installed: plug the terminal resistor into the “OUT” port of the master module and the “IN” port of the last slave module. Two (2) or more BCU require two (2) terminal resistors.

The length of the power cables from each tower to the combiner box should be the same.

It is recommended that the power cable length between battery towers and the inverter should be less than 3 meters.

Individual one battery system do not require terminal resistors.

6.3 Connecting the Grounding Conductor

When installing, the grounding wire must be installed first; when removing the equipment, the grounding wire must be removed last.

Additional required installation materials (not included in the scope of delivery): PE with terminals.

PE Requirements:

The cross section of the earth terminal must comply with the applicable local standards and directives

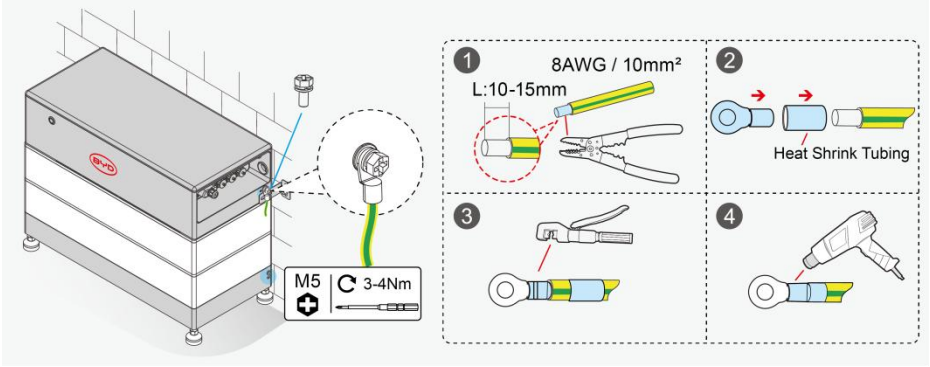
- OT Terminal: 10 mm²-M5
- PE section: 10 mm²
- PE material: copper

Note: If the maximum current of the connected inverter is no more than 40A, a grounding cable with 6mm² cross-section area is also acceptable.

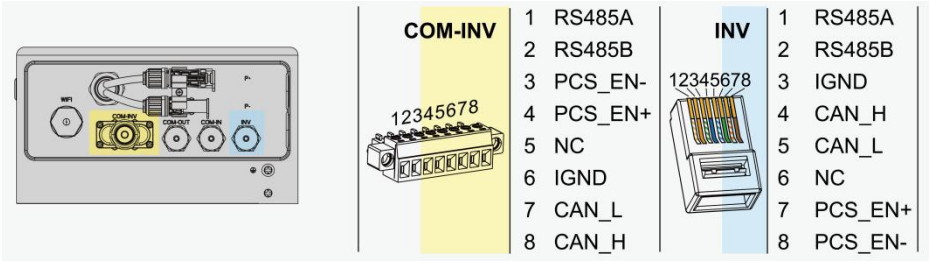
Steps:

1. Connect the ground wire and the OT terminal together.

2. Fix the ground wire on the BCU and tighten it (torque, 3-4 Nm).



6.4 Data Cable Connection



Do not crimp the unused pins when making the communication cable between the battery and the inverter.

6.4.1 Inverter Cable Connection between Inverter and One Battery System

QUALIFIED PERSON

There are two communication modes for connecting HVB to the inverter, one of which can be selected for connection.

Option A: RJ45

Option B: 8-Pin Terminal

Read the inverter port name on the battery system and the inverter manual to decide whether to modify the data cable. The definition of the inverter port on the battery system can be seen above.

Additional required installation materials (not included in the scope of delivery), one data cable.

Data cable requirements:

The length and quality of the cable affect the quality of the signal.

- Cable category: Cat.5, Cat.5e or higher
- Plug type: Cat.5, Cat.5e or higher metal shield RJ45
- Shield: Yes
- UV protection for outdoor use
- Advice maximum cable length: 3 meters

Option A: RJ45

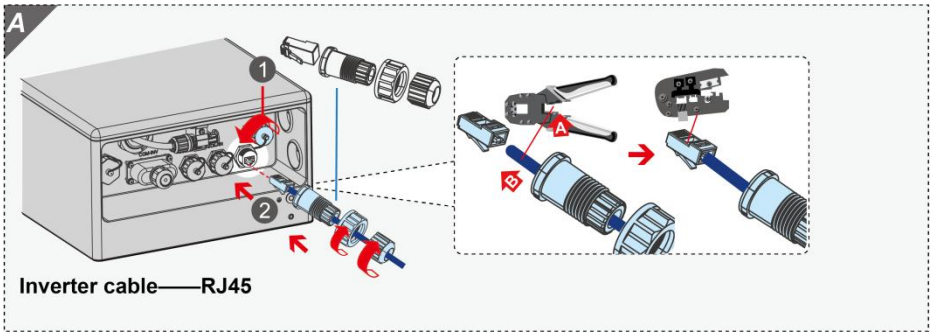
Steps:

1. Unscrew the waterproof cover on the INV connector.

2. Pass the communication wire through the waterproof cover.Please cut off the cable, arrange the cable position, and crimp the RJ45 connector with the network cable clamp.

3. Insert the RJ45 connector into the INV port of the BCU and tighten the waterproof cover.

4. Insert the other end of the connector into the corresponding port of the inverter.



Option B: 8-Pin Terminal

Steps:

1. Remove the external waterproof cover on the COM - INV.

2. Connect the quick connector terminal.

A: Pass the communication line through the external waterproof cover.

B: Loosen the screw of the quick-insertion terminal with a screwdriver.

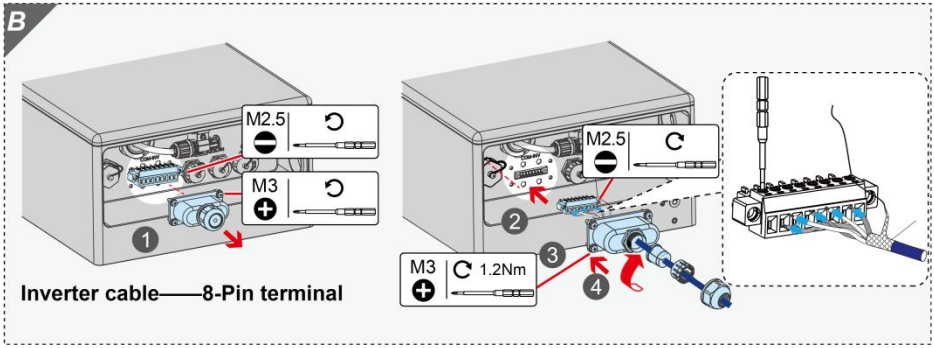
C: Insert the harness into the quick-connect terminal, and then tighten the screw.

D: Insert the wired quick connector into the COM - INV port of the BCU and tighten the screw.

3. Install the outer waterproof cover (torque, 1.2 Nm).

4. Tighten the external waterproof cover in turn (torque, 1.2 Nm).

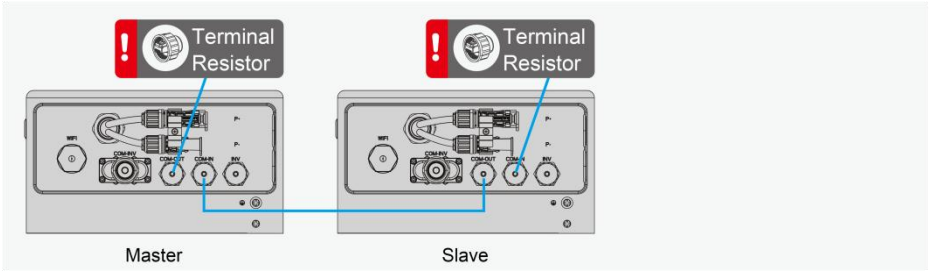
5. Insert the other end of the connector into the corresponding port of the inverter.

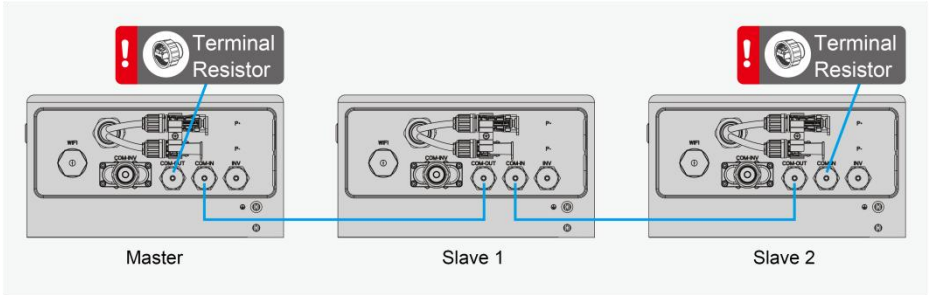

B
M2.5
M3
1
Inverter cable——8-Pin terminal
M2.5
2
3
M3
1.2Nm
4

6.4.2 Data Cable Connection between Parallel Battery System

This only applies when there are multiple towers in parallel. Data Cable Requirements: The length and quality of the cable affects the quality of the signal.

- Observe the following cable requirements.
- Cable category: Cat.5, Cat.5e or higher
- Plug type: Cat.5, Cat.5e or higher metal shield RJ45
- Shield: Yes
- UV protection for outdoor use
- Straight-through cable
- Advice maximum cable length between two towers: 3m





Steps:

1. Remove the IN & OUT external waterproof cover.

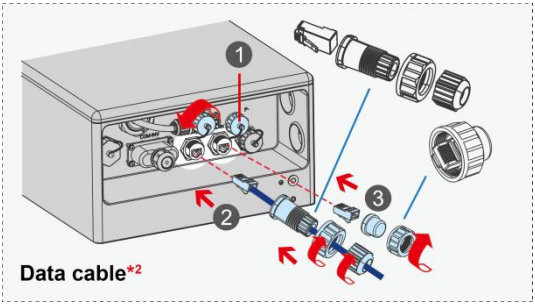
2. Plug the RJ45 connector into the OUT port of the first tower's BCU and the IN port of the second tower's BCU.

3. Repeat step 2 for the following columns.Cover the terminating resistors on the multiple towers,

see 6.2.2 in this manual.Assemble the outer waterproof cover.

* Data Cable & terminal resistor are used for parallel connection

* Connect terminal resistor, Plug the terminal resistor into the “**OUT**” port of the master system and the “**IN**” port of the last slave system.



6.5 DC Connection

QUALIFIED PERSON

DANGER

Danger to life from electric shock due to live power cables or connectors at the battery system

The power cables connected to the battery system may be live. Touching the power conductors or the live components leads to lethal electric shocks.

- Do not touch non-insulated cable ends.

When connecting multiple towers, the length of the positive power cable should be approximately equal for all towers, and the negative power cable should also be approximately equal. A combiner box is required to combine these cables. Follow your local, state, provincial, federal, or national laws, regulations, and inverter manufacturer's instructions to select the appropriate combiner box.

Additional required installation materials (not included in the scope of delivery): Two power cables (connecting battery system and inverter)

Cable requirements:

- Conductor section: 6mm^2 /10mm^2 . Select the correct option based on the application and

the inverter manufacturer's requirements.

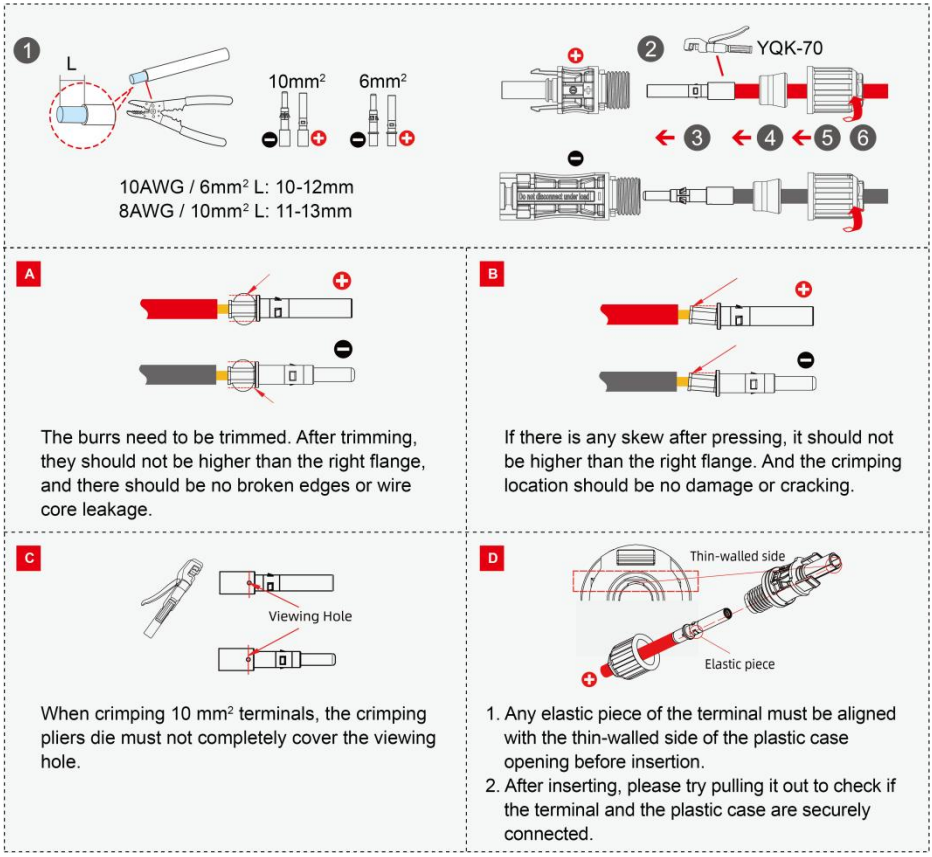
- Advice maximum cable length: 3m

Steps:

1. Use wire strippers to strip the insulation layer of the positive and negative cables to an appropriate length.

2. Put the insulation layer of the positive and negative cables into the corresponding metal terminals, and crimp them tightly with crimping pliers.

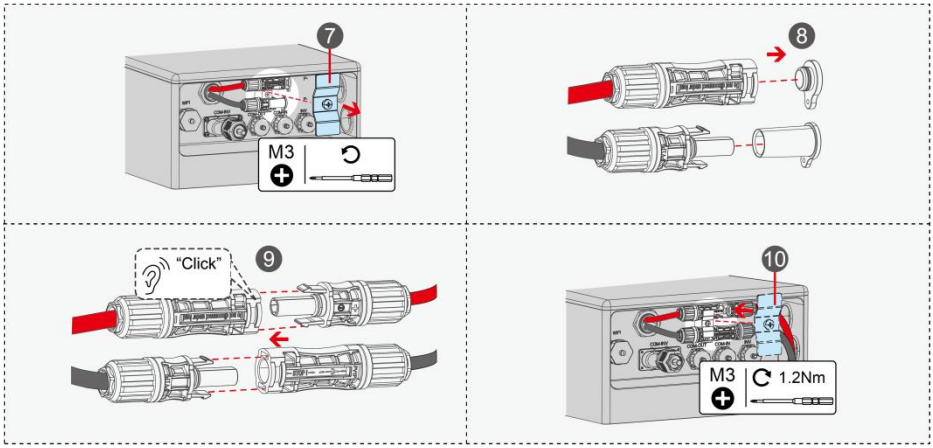
3~6. Insert the crimped positive and negative cables into the corresponding insulating shells, Tighten the plastic nuts at the end of the insulating shell of the positive and negative connectors.



7. Loosen the bracket fixing the positive and negative poles of the power cable.

8~9. Remove the protection plugs of the positive and negative poles of the power cable of the inverter. Insert the positive and negative connectors into the positive and negative poles of the power cable of the inverter.

11. Tighten the bracket fixing the positive and negative poles of the power cable (torque, 1.2 Nm).

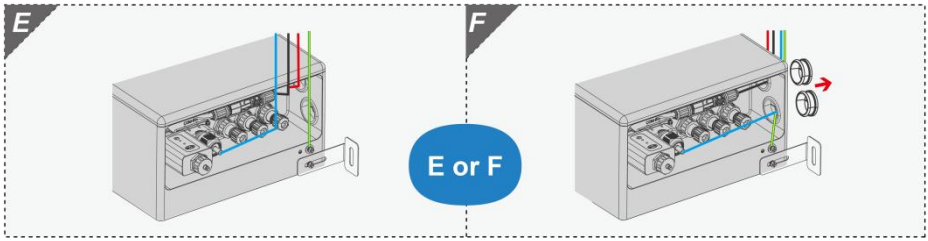


Outgoing Line Mode

There are two outlet types:

Option E: Side outgoing line

Option F: Back outgoing line

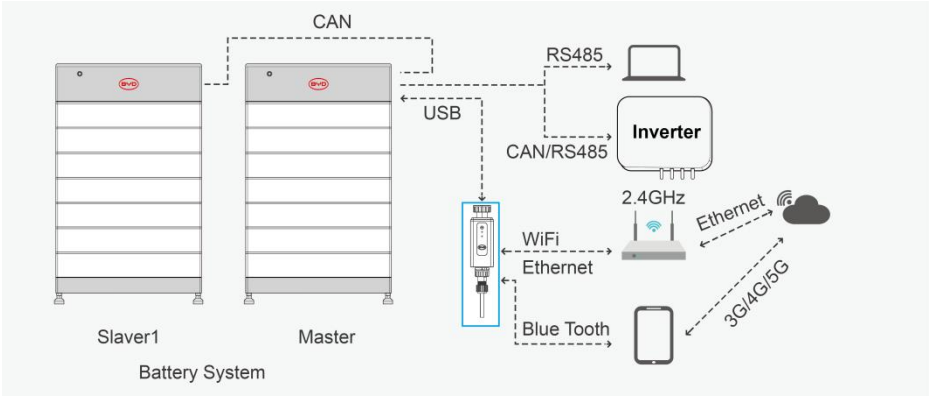


6.6 BYD Smart WiFi/LAN Module Installation

6.6.1 Inverters + HVB

If one battery system does not have the Smart WiFi/LAN Module, the system cannot connect to the Internet.

If two or three battery systems are operating in parallel simultaneously, the Smart WiFi/LAN Module only needs to be installed in the master of battery systems.In this case, it should be installed on the battery system that connected to the inverter via communication cables.



6.6.2 Installation Procedure

QUALIFIED PERSON

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.

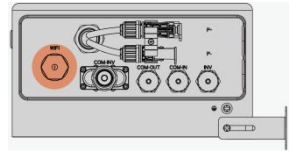
- Ensure that all devices and inverters in the same network are integrated into the existing surge protection.
- When laying network cables or other data cables outdoors, it must be ensured that a suitable surge protection device is provided at the transition point of the cable from the outdoor battery system or inverter to the interior of the building.

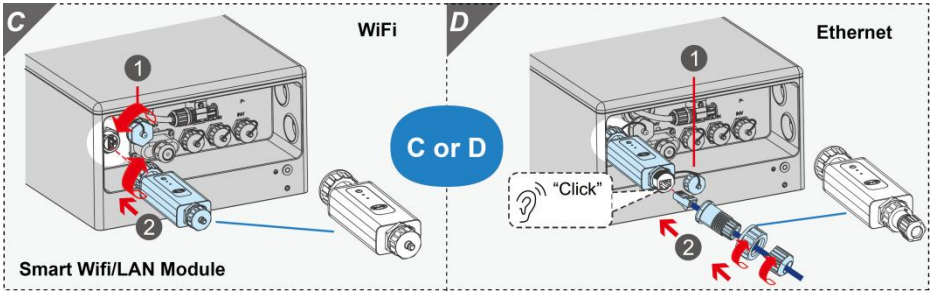
- We recommend that you install the Smart WiFi/LAN Module and complete the network configuration simultaneously when installing the battery system, to enable real-time monitoring of the battery's working status and ensure the battery operates in an optimal software environment.
- Connection to the Internet is not mandatory, but is recommended.

6.6.3 Connect the Smart WiFi/LAN Module to the BCU

Option C: WiFi

Option D: Ethernet





There are two remote connection modes:

Option C: the installer need to configure the network account and password through App.Refer to 7.2 for details.

Option D:
the installer can without configuring a network account and password through the App.When the network cable is plugged into the Smart WiFi/LAN Module and the green indicator light is always on, it means that the network has been connected successfully.

It should be noted that the Bluetooth connection between App and Smart WiFi/LAN Module can be realized regardless of the option C or D. Please refer to 7.2 for details.

This is the LED signal for Smart WiFi/LAN Module:

Indicator	Frequency	Status	Description
Bluetooth	On for 0.5s and then off for 0.5s		Blinking slowly: The Bluetooth is not connected.
	Steady on		Steady on: The Bluetooth connection is successful.
	On for 0.1s and then off for 0.1s		Blinking quickly: Bluetooth pairing mode.
Network	On for 0.5s and then off for 0.5s		Blinking slowly: The Network is not connected.
	Steady on		Steady on: The Network connection is successful.
Bluetooth & Network	From steady on to blinking quickly,after 3 seconds,blinking slowly		steady on > blinking quickly > blinking slowly: Bluetooth and Network restore factory settings

First of all, after connecting the Smart WiFi/LAN Module to the BCU, the indicator usually goes into the Waiting for Network Configuration state.

For the first connection, it is recommended to use the BYD energy App on the phone to connect to the Smart WiFi/LAN Module via Bluetooth, and then connect to the network according to the App prompt.

The following is a detailed description of the key operation of the Smart WiFi/LAN Module:

Operation	Description
Press and hold for more than 10 seconds	Restore factory settings
press and hold for more than 3 seconds	Re-enter the distribution network status after completing the distribution network setup
Press and hold for more than 3 seconds	Reset the Bluetooth at Single Bluetooth connection mode

7 Commissioning

7.1 Switch on the Battery System

QUALIFIED PERSON

Requirements:

- The power line connection between the battery system and the inverter must be closed.
- The inverter must be installed correctly.
- All cables must be properly connected.
- The operation panel is well fixed.

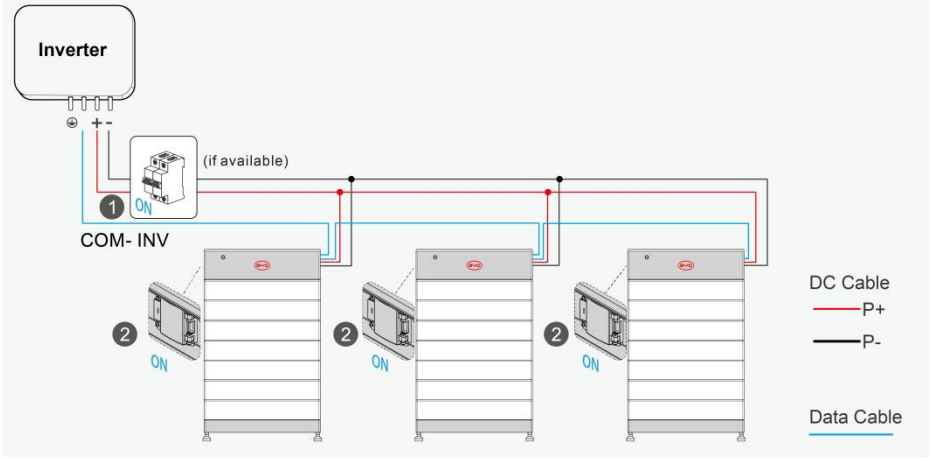
Steps:

1. Turn on the circuit breaker between the battery and the inverter (if any).

2. Push the main switch from "OFF" to "ON".

3. The LED starts blinking for a while (0.5 seconds white and 0.5 seconds blue alternating) and then changes to white, which means the battery system is ready to work.

4. If the battery system cannot be opened, please read Chapter 11 Troubleshooting and Service Guide and Checklist.If the problem still cannot be solved, please contact our local after-sales service team within 48 hours.



Max. short circuit current value: 3.6kA (HVB), **short circuit duration:** <8ms

7.2 Configuration of battery system

QUALIFIED PERSON

Inverter + HVB

Refer to the Inverter User Manual and BYD Energy App Quick Operation Guide for configuration steps.

7.3 Switch on and Commission the Inverter

The steps are different for on grid and off grid applications.

7.3.1 On Grid Applications

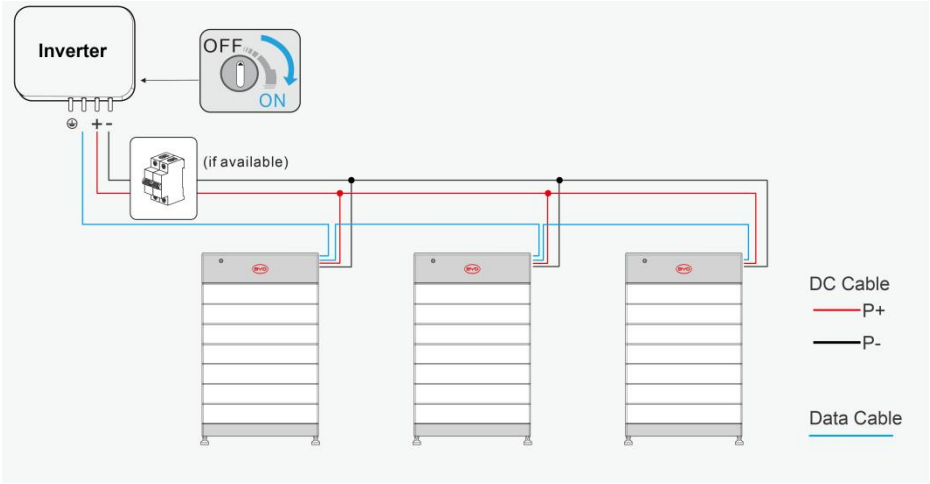
Steps:

1. Install and connect the inverter according to its instructions.

2. Set the DC disconnector of the inverter to the "ON".

3. Configure and debug the inverter according to the instructions of the inverter.

If the battery information can be read correctly on the inverter, it means that the connection is OK. If the LED is blinking blue, and/or some battery errors are displayed on the inverter, refer to Chapter 11 Trouble- shooting in this manual and read the Service Guide and Checklist.



Max. short circuit current value: 3.6kA (HVB), **short circuit duration:** <8ms

7.3.2 Off Grid Applications

Steps:

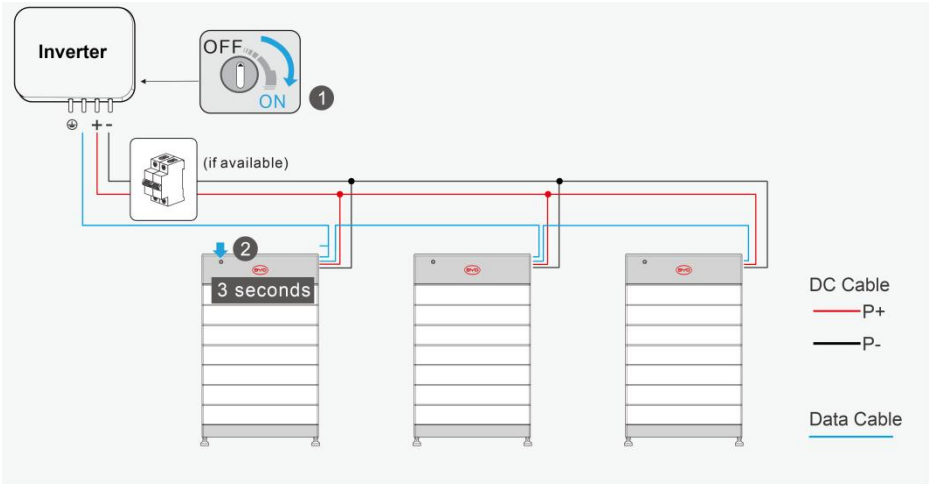
1. Install and connect the inverter according to its instructions.

2. Set the DC disconnector of the inverter to the “ON”.

3. Black start: press the LED button on the main system BCU for 3 seconds.

4. Configure and debug the inverter according to the instructions of the inverter.

If the battery information can be read correctly on the inverter, it means that the connection is OK. If the LED is still blinking blue, and/or some battery errors are displayed on the inverter, refer to Chapter 11 Troubleshooting in this manual and read the Service Guide and Checklist.



Max. short circuit current value: 3.6kA (HVB), **short circuit duration:** <8ms

8 Operation

8.1 Switch on Battery System

8.1.1 On Grid Applications

To ensure that the battery system works well with the inverter, follow the correct procedure to start them.

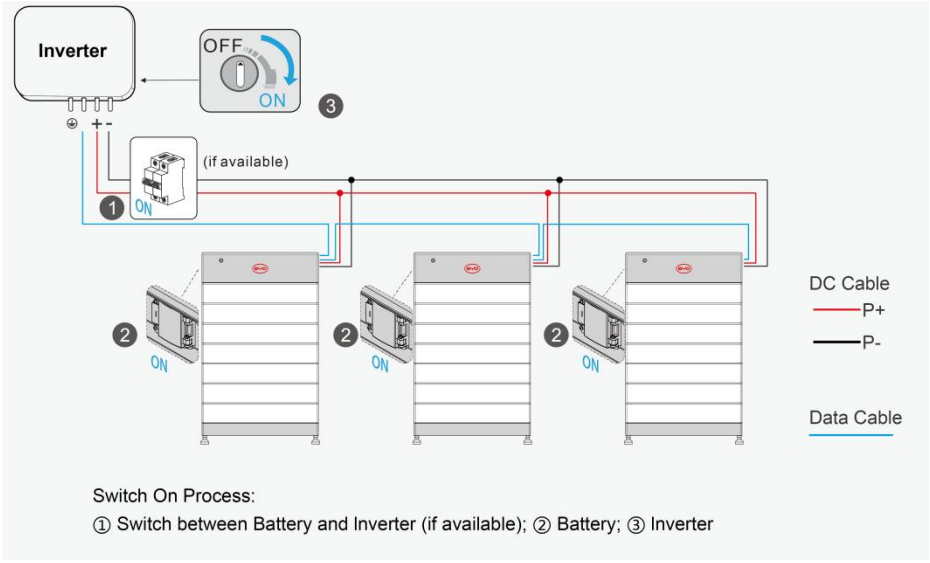
Max. short circuit current value: 3.6kA (HVB), Short circuit duration:＜ 8ms

Steps:

1. Turn on the circuit breaker between the inverter and the battery (if there is one).

2. Turn on the battery system.

3. Set the DC disconnector of the inverter to the “ON”.



Max. short circuit current value: 3.6kA (HVB), **short circuit duration:** <8ms

8.1.2 Off Grid Applications

To ensure that the battery system works well with the inverter, follow the correct procedure to start them.

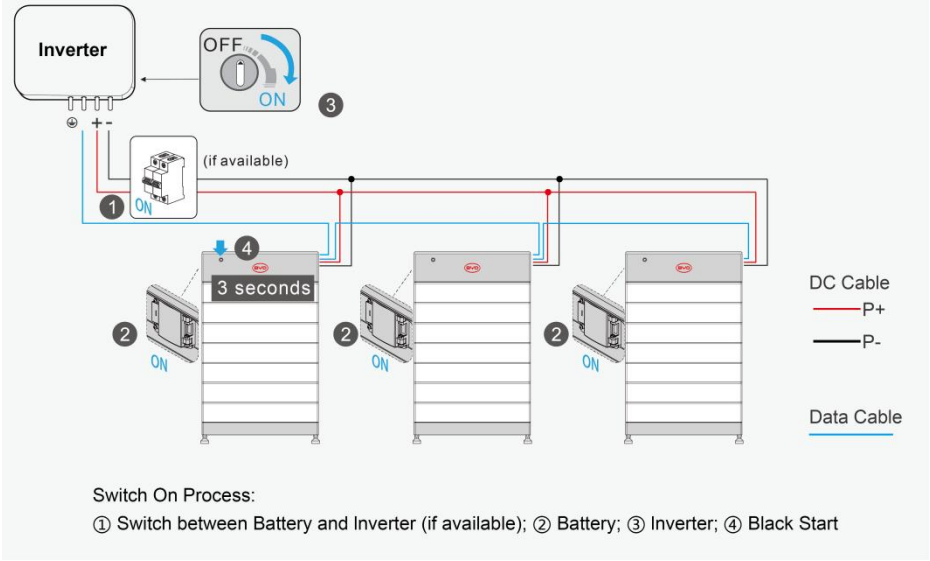
Steps:

1. Turn on the switch between the inverter and the battery (if there is one).

2. Turn on the battery system.

3. Set the DC disconnector of the inverter to the “ON”.

4. Black start: Press the LED button of the main system for 3 seconds.



Max. short circuit current value: 3.6kA (HVB), **short circuit duration:** <8ms

8.2 Shut Down the Battery System

Steps:

The procedure to switch off the battery system is:

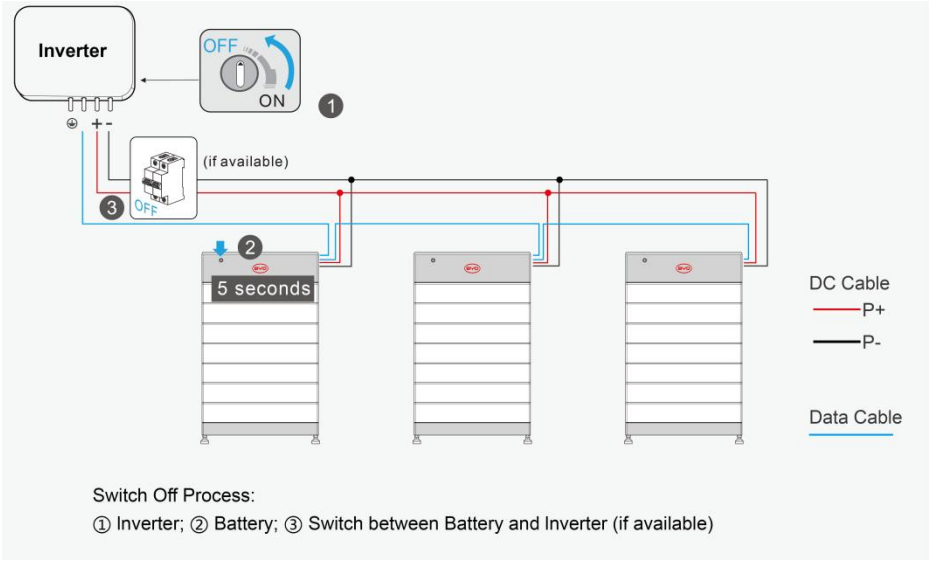
1. Set the DC disconnector of the inverter to the “OFF”.

2. switch off the battery.

3. switch off the circuit breaker between the battery and the inverter if there is any.

The correct way to switch off the battery system is to press the LED Button for 5 seconds on the BCU, but not to pull down the main switch of BCU.

If two or three battery systems are connected in parallel, only the LED Button on the master system needs to be pressed. The slave system(s) will be turned off automatically.



Max. short circuit current value: 3.6kA (HVB), **short circuit duration:** <8ms

8.3 Safety Design

The system will switch off automatically,in one of these two cases:

If there communication between battery system and inverter is interrupted, after 5 minutes, the LED indicator will enter flashing blue at a frequency of 1 s. The system will wait for the inverter to re-established.
After 23.5 hours,the system will enter the error, at same time the LED indicator light will enter constant blue and the system will be switch off automatically after 30 minutes.

If there is an error, the LED indicator light will be on constantly during this period, and the system will be switch off automatically after 30 minutes.

8.4 Protective Devices

If the HVB battery system configuration list is not met, the battery system can protect itself (shut down). If external protection is required, follow local, state, provincial, federal, or national laws, regulations, and the inverter manufacturer's instructions.

9 Disassembly

QUALIFIED PERSON

DANGER

Danger to life from electric shock due to live power cables or connectors at the battery system

The power cables connected to the battery system may be live. Touching the DC conductors or the live components leads to lethal electric shocks.

- Do not touch non-insulated cable ends.

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 system.

Procedure:

1. Switch off the inverter.

2. Switch off the battery system.

3. Switch off the circuit breaker between the inverter and the battery system if there is any.

4. Remove all the cables from the battery system.

5. Loosen the screws on the hangers between BCU and the wall. And then take off the hangers.

6. Tighten all the protective nuts on the BCU.

7. Remove the BCU from the battery modules and battery modules from the base. Before lifting the battery module, ensure that the screws on both sides of them are removed.

8. Remove the hangers (BCU part).

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

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

10 Capacity Expansion

Advice charge or discharge the existing system to an SOC of around 25~30%.

Note: new modules have a SOC of around 25~30%.

The battery system will automatically balance the SOC of difference battery modules to the same, after multiple charge-discharge cycles. It depends on the actual charging and discharging conditions, which may take several days or even a month.

Steps:

1. Turn off the inverter.

2. Shut down the battery system.

3. Turn off the circuit breaker (if any) between the inverter and the battery system.

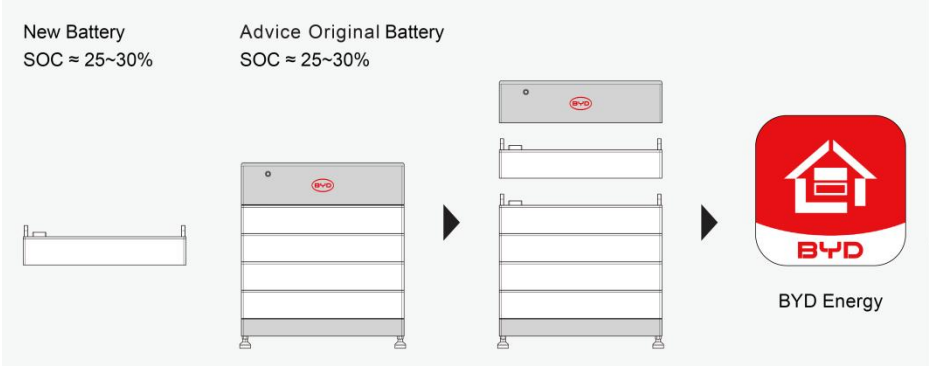
4. Remove the BCU.

5. Add the new module on top of the other battery modules.

6. Place the BCU back on top of the new battery module.

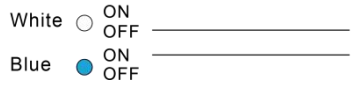
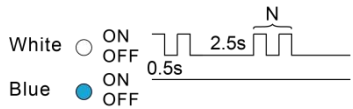
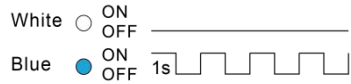
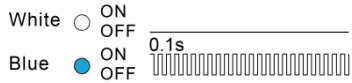
7. Turn on and configure the battery system.

8. Switch on the inverter.



11 Fault Guide

11.1 LED Failure Indication

Indicator	Status	Description
Constant blue		BCU failure
Constant blue and white light flashes a certain number of times		Flashing N times, represents the Nth battery module failure, Counting from top to bottom. HVB: 1≤N≤10
Flashing blue		The battery has entered a protective state.
Flashing blue quickly		Exit System

11.2 Service Guide

In addition to the LED light, we can also get the fault information of the battery through the mobile phone application. Please refer to the latest Service Guideline and Checklist for detailed steps. Website: www.bydenergy.com.

The battery module cannot be turned on/off. Check that the system has been built according to **BYD BATTERY-BOX HVB&HVM+&HVS+ COMPATIBLE INVERTER LIST**. If the problem still cannot be solved, please contact the local BYD after-sales service within 48 hours.

NOTICE

Battery module is damaged due to too low voltage.

- If the battery module does not start at all, please contact BYD's local after-sales service within 48 hours. Otherwise, the battery may be permanently damaged.

12 Storage

Cleaning

It is recommended that the battery system be cleaned periodically. If the enclosure is dirty, please use a soft, dry brush or a dust collector to remove the dust. Liquids such as solvents, abrasives, or corrosive liquids should not be used to clean the enclosure.

The battery module should be stored in an environment with a temperature range between -20°C～ +50°C, 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 charged and discharged relative to its maximum capacity) to the SOC of 30% after a long time of storage.

Storage temperature	Storage humidity	Storage time	SOC
Below -20°C	/	Not allowed	/
-20~25°C	5%~70%	≤ 12 months	25% ≤ SOC ≤ 60%
25~35°C	5%~70%	≤ 6 months	25% ≤ SOC ≤ 60%
35~50°C	5%~70%	≤ 3 months	25% ≤ SOC ≤ 60%
Above 50°C	/	Not allowed	/

NOTICE

Damage to the system due to under voltages.

- Charge the over-discharged system within seven days when the temperature is above 25°C.
- Charge the over-discharged system within fifteen days when the temperature is below 25°C.

13 Maintenance and Replacement

- Do not perform maintenance on the equipment unless you are familiar with the contents of this manual and have the proper tools and test equipment.
- Professional technicians and operators shall be fully trained and have knowledge of safe operation and maintenance of the equipment. They should take adequate precautions and personal protective equipment while operating.
- Before the equipment is repaired, the power must be cut off and the safety precautions in this manual and other relevant documents must be strictly observed.
- During maintenance, try to avoid irrelevant personnel entering the site.
- The unit cannot be powered up again until all faults have been resolved. Failure to do so may result in more problems or damage to the device.
- Do not open the cover without authorization, otherwise there is a risk of electric shock. Any faults caused by the above reasons are not covered by the warranty.
- Replace the battery with the same type.
- Immediately after completing maintenance, check to make sure no tools or other parts are left in the equipment.
- When the battery is idle for a long time, it must be stored and charged according to this manual.

14 Disposal of Battery System

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

- Do not dispose of the battery system 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 or to arrange a collection please contact BYD Service Partner (see contact details at the bottom of this document).

15 Technical Parameters

			
PERFORMANCE	**HVB 5.9**	**HVB 8.9**	**HVB 11.8**
Battery Module		HVB Module (2.97 kWh, 51.2 V, 27.3 kg)	
Number of Modules	2	3	4
Usable Energy [1]	5.94 kWh	8.91 kWh	11.88 kWh
Nominal Voltage	102.4 V	153.6 V	204.8 V
Operating Voltage	80 ~ 115.2 V	120 ~ 172.8 V	160 ~ 230.4 V
Dimensions (H/W/D)	479 x 610 x 282 mm	585 x 610 x 282 mm	691 x 610 x 282 mm
Weight	68.7 kg	96 kg	123.3 kg

			
	HVB 14.8	**HVB 17.8**	**HVB 20.7**
Number of Modules	5	6	7
Usable Energy [1]	14.85 kWh	17.82 kWh	20.79 kWh
Nominal Voltage	256.0 V	307.2 V	358.4 V
Operating Voltage	200 ~ 288 V	240 ~ 345.6 V	280 ~ 403.2 V
Dimensions (H/W/D)	797 x 610 x 282 mm	903 x 610 x 282 mm	1009 x 610 x 282 mm
Weight	150.6 kg	177.9 kg	205.2 kg

			
	HVB 23.7	**HVB 26.7**	**HVB 29.6**
Number of Modules	8	9	10
Usable Energy [1]	23.76 kWh	26.72 kWh	29.69 kWh
Nominal Voltage	409.6 V	460.8 V	512.0 V
Operating Voltage	320 ~ 460.8 V	360 ~ 518.4 V	400 ~ 576 V
Dimensions (H/W/D)	1115 x 610 x 282 mm	1221 x 610 x 282 mm	1327 x 610 x 282 mm
Weight	232.5 kg	259.8 kg	287.1 kg

GENERAL DATA	
Max Output Current [2]	50 A
Peak Output Current [2]	98 A, 15 s
Scalability	Max. 3 in Parallel (89.07 kWh)
Installation Mode	Floor installation
Communication	CAN / RS485
Round-trip Efficiency	≥ 95%
Applications	On Grid / On Grid + Backup / Off Grid
Operating Temperature	-20°C to +50°C
IP Class	IP55
Storage Humidity	5%~95%
Altitude	< 4000 m
Battery Cell Technology	Lithium Iron Phosphate (cobalt-free)
Warranty [3]	15 Years
Accessories	BYD smart WiFi/LAN Module

[1] DC Usable Energy, Test conditions: 100% DOD, 0.2C charge & discharge at + 25°C. System Usable Energy may vary with different inverter brands.
[2] Power derating will occur between -20°C and 10°C.
[3] Conditions apply. Refer to BYD Battery-Box HVB Limited Warranty Letter.

Note

A: 2.97kWh is the initial capacity (designed) of the Energy Storage Module.

B: The actual capacity is affected by the external environment (such as temperature, transportation, and storage).

No.	Detailed description of technical parameters
1	**Power (W):**

Model	Power (kW) at 20% SOC	Power (kW) at 80% SOC	Ratio between nominal battery power (kW) and battery energy (kWh)
HVB 5.9	4.87	5.11	86.2%
HVB 8.9	7.33	7.70	86.2%
HVB 11.8	9.79	10.29	86.2%
HVB 14.8	12.26	12.88	86.2%
HVB 17.8	14.72	15.47	86.2%
HVB 20.7	17.18	18.05	86.2%
HVB 23.7	19.65	20.64	86.2%
HVB 26.7	22.11	23.23	86.2%
HVB 29.6	24.58	25.82	86.2%

Test Condition & Method:

Detected the power (W) when SOC at 20% or 80%. The power tested by power analyzer.

2 **Internal resistance increase (%)**

Model	Internal resistance increase (%)
HVB 5.9	15% (After 5500 cycles)
HVB 8.9	15% (After 5500 cycles)
HVB 11.8	15% (After 5500 cycles)
HVB 14.8	15% (After 5500 cycles)
HVB 17.8	15% (After 5500 cycles)
HVB 20.7	15% (After 5500 cycles)
HVB 23.7	15% (After 5500 cycles)
HVB 26.7	15% (After 5500 cycles)
HVB 29.6	15% (After 5500 cycles)

Test Condition & Method:

The result is based on 5500 charge and discharge cycles.

3 Expected life-time (cycles and calendar years)

Model	Expected life-time (cycles and calendar years@ 25℃)
HVB 5.9	5500 cycles or above 15 years using
HVB 8.9	5500 cycles or above 15 years using
HVB 11.8	5500 cycles or above 15 years using
HVB 14.8	5500 cycles or above 15 years using
HVB 17.8	5500 cycles or above 15 years using
HVB 20.7	5500 cycles or above 15 years using
HVB 23.7	5500 cycles or above 15 years using
HVB 26.7	5500 cycles or above 15 years using
HVB 29.6	5500 cycles or above 15 years using

Test Condition & Method：

The remaining capacity is above 60% to rated capacity after 5500 times charge-discharge cycles is conducted.

Cycle-life test condition:

a) Charge: Constant current voltage mode, 25 A, cut off at any cell up to 3.5V; then constant current mode, 10 A, cut off at any cell up to 3.6V
b) Rest: 30minute
c) Discharged: Constant current mode, 25A, cut off at any cell below 2.7V
d) Rest: 30minute
e) Repeat a)-d)

16 Contact Information

BYD Global Service

Address: No.3009, BYD Road, Pingshan, Shenzhen, 5118118, P.R.China
Service Mailbox: bboxservice1@fdbatt.com
Website: www.bydenergy.com

BYD Authorized Service Partner

EFT-Systems GmbH
Address: Bruchtannenstraße 28, 63801 Kleinostheim
Service Mailbox: service@eft-systems.de
Telephone: +49 9352 8523999, +44 (0) 2037695998(UK) ,+34 91 060 22 67(ES)
+39 02 87368364(IT)
Website: www.eft-systems.de

BYD Authorized Service Partner

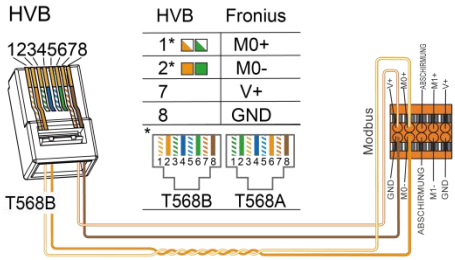
ALPS Power Pty Ltd
Address:2/62 Belmore Rd North, Riverwood NSW 2210
Service Mailbox: service@alpspower.com.au
Telephone:+61 2 8005 6688

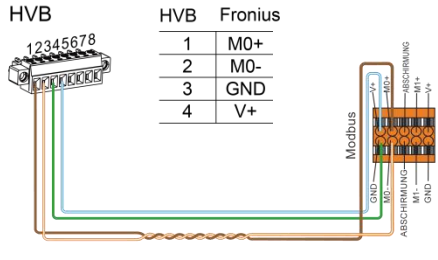
Appendix Connection Options with Inverters

Please first check if the planned configuration is already released according to the latest Battery-Box HVB Compatible Inverter List, before the installation.

Connection with Fronius

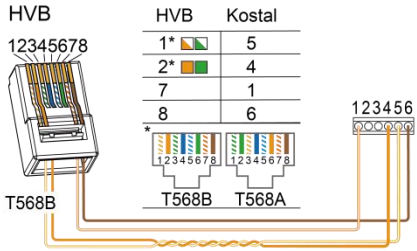
Verto Plus 15.0-33.3kW

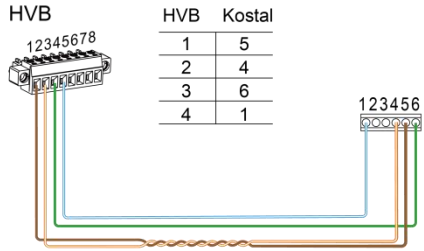




Connection with Kostal

PLENTICORE plus / G2 PLENTICORE BI xx/26 G2
PLENTICORE G3 / PLENTICORE MP G3





For Kostal inverter, the type of data cable need Cat7.

Connection with Kaco

Blueplanet hybrid 6.0 NH3 M2
Blueplanet hybrid 8.0-12.0 NH3 M3

