



BYD Battery-Box HV User Manual

Battery-Box H 5.1/6.4/7.7/9.0/10.2/11.5(AU)

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1 General Information

1.1 Validity

This user manual is applicable to the BYD Battery-Box H 5.1 / 6.4 / 7.7 / 9.0 / 10.2 / 11.5(AU).

1.2 Application

This user manual contains BYD Battery-Box HV product information, usage guidance, safety information, and details on common operating issues and subsequent corrective actions.

BYD Battery-Box HV is an energy storage unit that is designed to be used in residential on-grid applications with the capability for short-term backup.

1.3 Intended Use

Notes regarding intended use:

- BYD Battery-Box HV is not suitable for supporting life-sustaining medical devices. A power outage must not lead to the inability to use life-sustaining medical devices and subsequent personal injury.
- This product is intended for use only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and regulations. Any other application may cause personal injury or property damage.
- The illustrations in this manual are meant only to help explain system configuration concepts, includes usage guidance, safety precautions, and common operating issues and subsequent corrective actions.
- Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of BYD. Unauthorized alterations will void warranty claims. BYD shall not be held liable for any damage caused by such changes. Any use of the product other than that described in the Intended Use section does not qualify as appropriate. The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and observe all instructions contained therein. The type label (see Section 1.5) must remain attached to the product.
- BYD Battery-Box HV series products must work with compatible inverters which are listed in the "Compatible Inverter List" section of this manual.
- Please contact BYD or local after-service providers within 1 week once the user decides to cease using their BYD Battery-Box products.
- The Battery-Box HV system can be installed at altitudes of up to 2000m above Mean Sea Level.

1.4 Definition

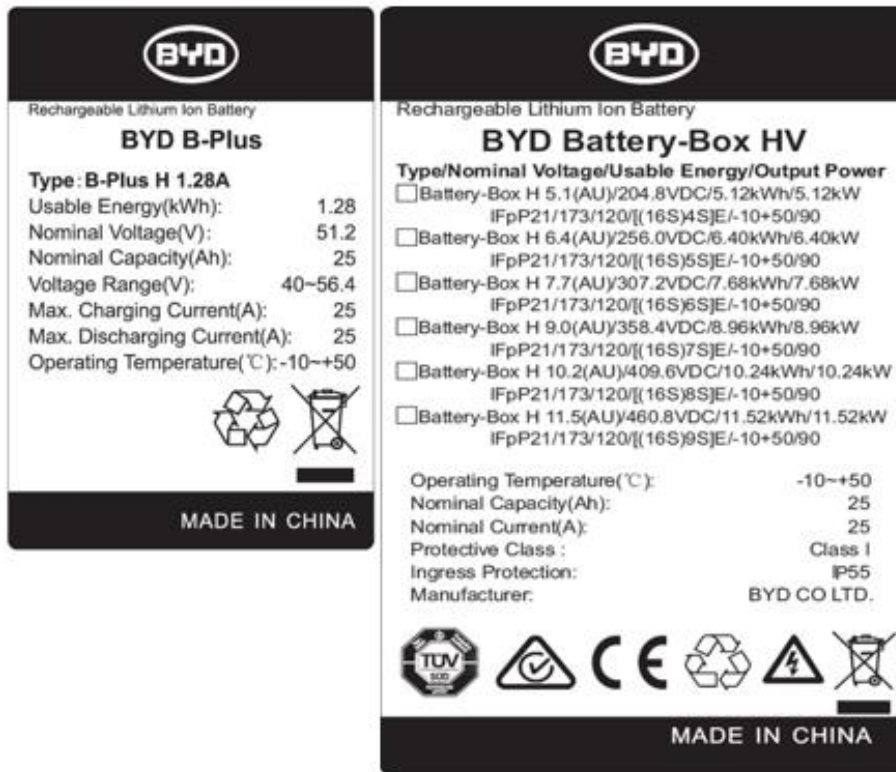
Battery-Box H 5.1~11.5(AU) components are defined as below:

- BYD Battery-Box HV: High-voltage household energy storage battery system.
- B-Plus H 1.28A: Battery module. The Battery module provides the energy and sends the information about the cell voltage and cell temperature in the battery module to the upper-layer BCU. The nominal capacity of the B-Plus H 1.28A battery is 1.28kWh.

- BCU: Battery Control unit and Base. Two parts consisting of both the battery management and control component mounted on top of the battery modules as well as structural base, which physically supports the battery modules underneath. The top portion of the BCU is responsible for communication to and connection with the inverter or BMU.

1.5 Identifying the Product

The type label contains the product identification information, and is attached on the product. For safe usage, the user must be well-informed of the contents in the type label. The type label includes:



2 Safety

This section contains safety information that must be observed at all times when working on or with batteries. To prevent personal injury or property damage and to ensure long-term operation of the batteries, read this section carefully and observe all safety information at all times.



WARNING

Environmental Requirements

- Do not expose the battery to temperature above 50°C.
- Do not install or use the battery near any heat sources.
- Do not install or use the battery in wet locations, such as bathroom.

- Do not expose them to moisture or liquids.
- Do not expose the battery to corrosive gases or liquids.
- Do not expose the battery to direct sunlight for extended periods of time.
- Place battery in secure location away from children and animals.
- Do not allow the battery power terminals to touch conductive objects such as wires.
- Do not dispose of batteries in a fire, which may explode.

Operation Precautions

- Do not touch the battery pack with wet hands.
- Do not crush, drop or puncture the battery.
- Always dispose of the batteries according to local safety regulations.
- Store and recharge battery in a manner in accordance with this user manual.
- Ensure reliable grounding.
- Do not short circuit the terminals, remove all metal objects including watches and rings that could product a short circuit before installation, replacement and maintenance.
- The battery shall be repaired, replaced or maintained by skilled personal recognized. (Skilled personnel recognized is a trained and qualified electrician or installer defined in installation guidance).
- Do not reverse the polarity.
- Do not stack up batteries without protective package, when storing or handling batteries.
- Do not open, mutilate or disassemble the battery, the released electrolyte, which may be toxic, is harmful to the skin and eyes.
- Disconnect the charging source prior to connecting or disconnecting battery terminals, for instance, disconnect battery from power/load and then power off battery before installation and maintenance.
- Packaged batteries should not be stacked more than specified number stipulated on the package.
- Do not lay tools or metal parts on top of batteries.
- Do not use damaged, failed or deformed batteries, which may reach temperatures that exceed the burn thresholds for touchable surfaces. Continued operation of damaged battery may result in dangerous situation and cause severe injury due to electrical shock.

3 Technical Data

Model	Battery-Box H 5.1(AU)	Battery-Box H 6.4(AU)	Battery-Box H 7.7(AU)	Battery-Box H 9.0(AU)	Battery-Box H 10.2(AU)	Battery-Box H 11.5(AU)
Battery Module	4 modules	5 modules	6 modules	7 modules	8 modules	9 modules
Usable Energy ¹ (kWh)	5.12	6.40	7.68	8.96	10.24	11.52
Max Output Power(kW)	5.12	6.40	7.68	8.96	10.24	11.52
Peak Output Power(kW)	10.24, 30s	12.80, 30s	15.36, 30s	17.92, 30s	20.48, 30s	23.04, 30s
Round-Trip Efficiency	≥95.3% (Under test condition [1])					
Nominal Voltage(V)	204	256	307	358	409	460
Operating Voltage Range(V)	160~225	200~282	240~338	280~395	320~451	360~500
Communication	CAN/RS485					
Dimension(W x H x D mm)	580×814× 380	580×937× 380	580×1060× 380	580×1183× 380	580×1306× 380	580×1429× 380
Net Weight(Kg)	123	149	175	201	227	253
Enclosure Protection Rating	IP55					
Operating Temperature Range ² (°C)	-10~+50					
Certification & Safety Standard	UL1642 / CE / RCM / TUV(IEC62619) / UN38.3					
Compatible Inverters	Please refer to the Compatible Inverter List ³					
Application	On grid (Self consumption / On grid + Backup / Backup)					
Short Circuit Current(kA)	1.5					
Pollution degree	III					
Overvoltage category	II					

When BYD Battery-Box HV operates in low temperatures, the charge and discharge current is adjusted automatically. The battery will limit the current when the operating temperature gets low. Please refer to the table below for current parameters related to operating temperature:

¹ Test conditions: 100% DOD, 0.2C charge & discharge at +25°C. System Usable Energy may be variant with different inverter brands.

² -10 °C to 12 °C will be derating.

³ BYD Compatible Inverter List is a document that is available on the website: www.alpspower.com.au.

Charge Current at Various Temperatures Ranges

Temperature Range (°C)	Relative humidity (%)	Normal Current(A)
-10~0	5~95	0.2C
0~12	5~95	0.5C
12~50	5~95	0.8C

Note: It will take 2 minutes for the charge current to adjust

Discharge Current at Various Temperatures Ranges

Temperature Range (°C)	Relative humidity (%)	Normal Current(A)
-10~40	5~95	1C
40~50	5~95	0.5C

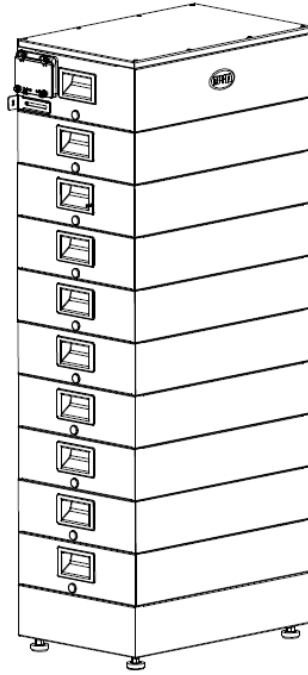
4 Technical Items

No.	Terms	Comment
1	Discharge	Battery output power for load
2	Charge	To put electricity into battery by charger
3	Full charged	Battery had been fully charged, SOC is 100%.
4	Idle	Ready for charging and discharging
5	Shutdown mode	Power off
6	SOC	State of Charge
7	SW	Software
8	HW	Hardware
9	Battery voltage	The voltage between B+/B-
10	Pack voltage	The voltage between P+/P-
11	Cell voltage	Single cell voltage
12	Failure	Battery or BMS is broken, need to be replaced
13	Alarm	Indicate that the battery is in abnormal status
14	Protect	Battery stops charging or discharging and is recoverable.
15	Over discharged	Battery is lack of electricity, and needs to be recharged in time.

5 Product Overview

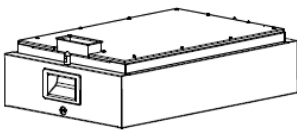
5.1 Brief Introduction

This product is a high-voltage DC battery system with an operating voltage range between 160~500V. It is utilized in household energy storage applications and works together with a high-voltage inverter to realize the goal of energy storage for the home. A battery system consist of 4 to 9 individual battery modules connected in serial.

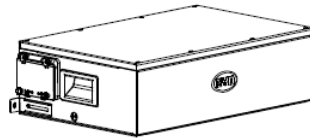


Product overview

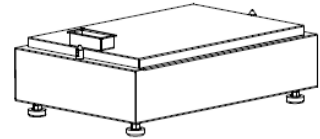
Major Components:



B-Plus H 1.28A



BCU



Base

5.2 BYD Battery-Box HV Configuration Table

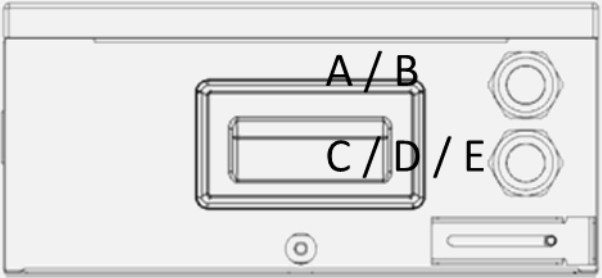
No.	Name	Configuration			Energy (kWh)	Voltage(V)
		BCU	B-Plus H 1.28A	Base		
1	Battery-Box H 5.1(AU)	1	4	1	5.12	160~225
2	Battery-Box H 6.4(AU)	1	5	1	6.40	200~282
3	Battery-Box H 7.7(AU)	1	6	1	7.68	240~338

4	Battery-Box H 9.0(AU)	1	7	1	8.96	280~395
5	Battery-Box H 10.2(AU)	1	8	1	10.24	320~451
6	Battery-Box H 11.5(AU)	1	9	1	11.52	360~500

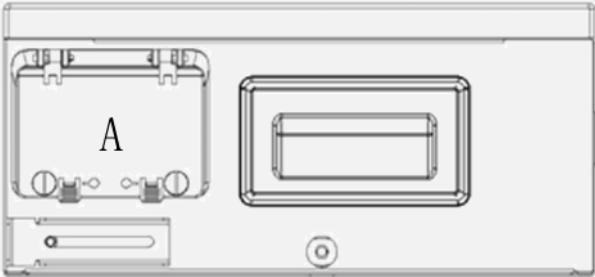
5.3 BCU Introduction

The component responsible for battery management and control. The BCU is connected to the battery modules below and to the inverter or BMU above.

5.3.1 BCU Interface Introduction (Left Side)

Position	Designation	Left side terminals
A	WAN	
B	COM	
C	GND	
D	P-	
E	P+	

5.3.2 BCU Interface Introduction (Right Side)

Position	Designation	Right side terminals
A	System Air Switch(40A/DC1000V)	

5.3.3 BCU Functional Interfaces Definition

No.	Interface Name	Description
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1	P+	The system positive terminal, connected to the inverter positive terminal for battery
2	P-	The system negative terminal, connected to the inverter negative terminal for battery
3	GND	Grounding terminal, connected to the ground
4	WAN	Connected to the Ethernet, to complete the functions of communication and remote program update
5	COM	Containing RS485, CAN, and enable signals, outputting 13V power
6	System Air Switch	The main switch of system, which can be operated manually and has the short circuit protection function

6 Cleaning and Maintenance

6.1 Cleaning

CAUTION:

Please power off the system before cleaning the BYD Battery-Box HV.

It is recommended that the BYD Battery-Box HV 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.

6.2 Maintenance

6.2.1 Recharge Requirements during Normal Storage

Batteries should be stored in an environment with a temperature range between $-10^{\circ}\text{C} \sim +45^{\circ}\text{C}$, and maintained regularly according to the following table with 0.5C (12.5A) current until 40% SOC after a long time of storage.

Recharge conditions when in storage			
Storage Environment Temperature	Relative Humidity of Storage Environment	Storage Time	SOC
Below -10°C	/	prohibit	/
$-10 \sim 25^{\circ}\text{C}$	5%~70%	≤ 12 months	$30\% \leq \text{SOC} \leq 60\%$
$25 \sim 35^{\circ}\text{C}$	5%~70%	≤ 6 months	$30\% \leq \text{SOC} \leq 60\%$
$35 \sim 45^{\circ}\text{C}$	5%~70%	≤ 3 months	$30\% \leq \text{SOC} \leq 60\%$
Above 45°C	/	prohibit	/

6.2.2 Recharge Requirements when Over Discharged

Please recharge the over discharged batteries in a timeframe that is in accordance to the following table, otherwise the over discharged battery modules will be damaged.

Recharge conditions when battery is over discharged

Storage Environment Temperature	Storage Time
-10~25°C	≤15 days
25~45°C	≤7 days

7 Compatible Inverter List

To make sure that the system can operate normally, please choose BYD compatible inverters and size the battery quantity accordingly. For more details, please refer to the Compatible Inverter List.

8 Common Issues and Solutions

8.1 Common Issues of BYD Battery-Box HV and Solutions

Issue Description	Possible Causes	Solution
Air Switch Off	Battery low voltage protection Battery high voltage protection Battery high temperature protection Other hardware failures.	Please contact our after sales service provider immediately.

If the BYD Battery-Box HV system has been connected to the router, user can monitor the running status of battery, warning, and alarm information via the built-in webpage, the log-in procedure is as following:

Enter the correct IP address in the browser (IE, Google Chrome or Mozilla Firefox browsers are recommended), and then enter the account and password to log in (the login ID: user; password: user). User can change the password by themselves after the first log-in.

Log in the built-in webpage by selecting one of the following ways:

- **LAN**

Connect the BYD Battery-Box HV system and the computer in the same LAN through router, get the system' s IP address on the router web page, then enter the system' s IP address or its host name: BYD + product serial number without the first three numbers (e.g. product serial

number is BYD100171708-00000, then host name will be BYD171708-00000) in the browser, and enter the account and password to log in.

- **Direct Connection with Network Cable**

Directly connect the computer to the network interface of BYD Battery-Box HV system with the network cable, reset the computer's IP address (e.g. 192.168.6.8) to make the computer and the BYD Battery-Box HV system on the same network segment, enter the IP: 192.168.6.1 in the browser, and enter the account and password to log in.

8.2 Common Issues Displayed on Inverter and Solutions

User can also monitor the running status of battery, warning, and alarm information from the App or LED display of the inverter.

The battery reports the below errors and alarms to the inverter. Please note the inverter will report an error based on its own error codes so the exact words may not match. The inverter may respond according to the error code/name uploaded by the battery.

Error Codes and Solutions

Error Code	Error Name	Causes	Solutions
0	BatteryCommErr	Battery internal communication failure	1. Minor communication issues will be automatically corrected. 2. If the failure persists, please contact our after sales service provider immediately.
1	MonitorCommErr	Battery internal communication failure	
7	Discharge_OC1	Discharge current limit protection	
8	Discharge_OC2	Discharge current limit protection	
11	Cell_UV1	Battery low voltage protection	Check if the system switch is closed, if it is, please ignore this message. Otherwise, wait until the inverter can charge the battery and manually close the system switch.
12	Cell_UV2	Battery low voltage protection	
13	Cell_UV3	Battery low voltage protection	Please contact our after sales service provider immediately.
18	Charge_OC1	Charge current limit protection	1. Minor communication issues will be automatically corrected. 2. If the failure persists, please contact our after sales service provider immediately.
19	Charge_OC2	Charge current limit protection	
22	Cell_OV1	Battery high voltage protection	Please contact our after sales service provider immediately.
23	Cell_OV2	Battery high voltage protection	
24	Cell_OV3	Battery high voltage protection	
25	Charge_OT1	Battery high temperature protection	1. Minor communication issues will be automatically corrected. 2. If the failure persists, please contact our after sales service provider immediately.
26	Charge_OT2	Battery high temperature protection	
27	Charge_OT3	Battery high temperature protection	
28	Charge_UT1	Battery low temperature protection	
29	Charge_UT2	Battery low temperature protection	
32	BatteryDiff	The voltage difference of battery cells is too high	
38	BatteryLock	Battery low voltage protection	

44	DischargeFault	The relays may be damaged	Please contact our after sales service provider immediately.
45	BatteryBreak	The system air switch is open	Close the system switch and view history alarms, and then contact our after sales service provider immediately.
46	InverterCommErr	Battery fail to communicate with inverter	Please contact our after sales service provider immediately.
47	HardwareFault	Battery internal hardware failure	
48	PrecahrgeFault	The voltage difference between B+/B- and P+/P- is too high when precharge.	1. Minor communication issues will be automatically corrected. 2. If the failure persists, please contact our after sales service provider immediately.
49	DCBusFault	The voltage of P+/P- is too low when precharge.	
50	UpdateSuccess	Update success	
51	UpdateFail	Update fail	Please ignore.
52	SysRestart	System is going to restart	
53	System_OT	System high temperature protection	
54	System_CHG_UT	System low temperature protection	1. Minor communication issues will be automatically corrected.
55	System_DIS_UT	System low temperature protection	2. If the failure persists, please contact our after sales service provider immediately.
57	BMUProcCommErr	BMU-process fail to communicate with BCU-process	
58	BlackStartErr	Battery fail to black start inverter	
59	StartFail	Battery normal start failure	

8.3 Emergency

Please cut off the power supply and turn off the battery in an emergency.

9 Warranty

BYD provides warranty when the product is installed and used according to the instructions contain in the User Manual, Installation Manual, and Warranty Letter.

1. Please contact our local service provider for technical support & after sales service.
2. Please download the Warranty Letter via the following website:

Australian customer: www.alpspower.com.au

Contact Information

China

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