



Installation Guidance

B-Box Pro2.5~10.0

Rev 2.1_Jul.2017

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Installation Video Website:<http://www.byd.com/energy/b-box-25.htm>

Safety



CAUTION:

Li-ion battery (energy storage unit) inside. When assembling the system, do not intentionally make a short connection between the positive (+) and negative (-) terminals of the battery box with a metallic object.

All works on the B-Box and electrical connections must be carried out by qualified personnel only.

B-Box provides a safe source of electrical energy when operated as intended and as designed.

Potentially hazardous circumstances such as excessive heat or electrolyte mist may occur under improper operating conditions, damage, misuse and abuse.

The following safety precautions and the warning messages described in this section must be observed. If any of the following precautions are not fully understood, or if you have any questions, contact customer service for guidance. The Safety Section may not include all regulations for your region; personnel working with B-Boxes must review applicable federal, state and local regulations as well as the industry standards regarding this product.

Installation personnel cannot wear watches, etc., to avoid short circuit and accidental damage.

Ensure reliable grounding. Do not reverse the front panel.



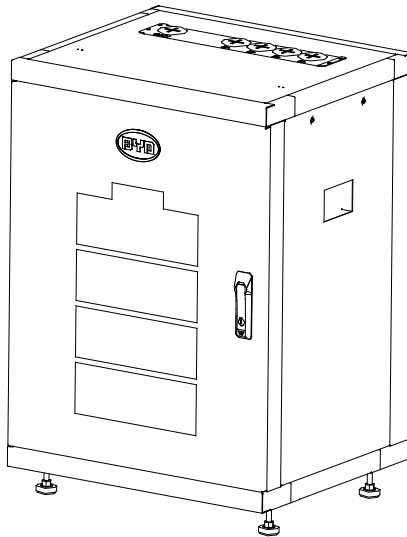
CAUTION:

Due to the heavy weight of BYD B-Box 2.5~10.0, please use strong packaging and safety protection equipment during transportation, to ensure safety and avoid accidental damage.

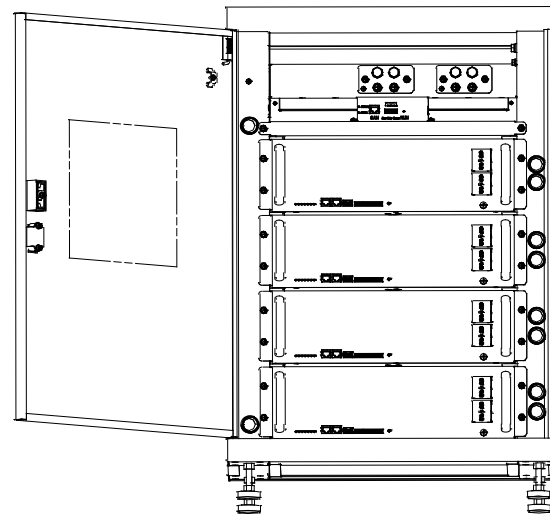
When increase battery, power off the battery and other power input first.

1 Product Overview

BYD battery box products B-Box Pro 2.5~10.0 as the energy storage parts can be used in off-grid & on-grid energy storage system.

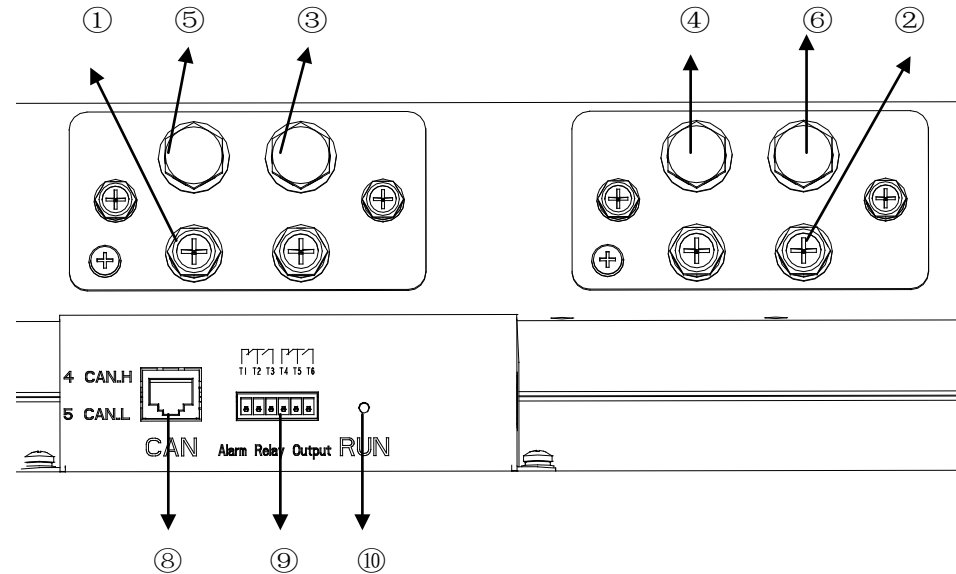


Overview of B-BOX



Internal view of B-BOX

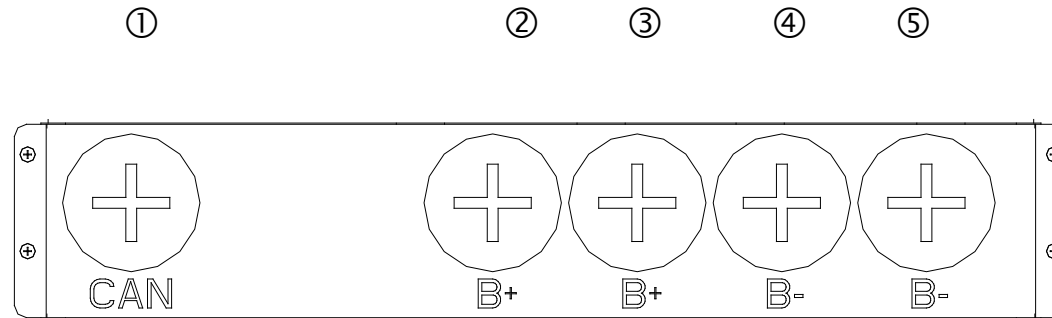
2 Cabinet terminal introduction



Terminal list

No.	Interface	Mark	Function
①	B+	/	Connect to battery in cabinet, each terminal can connect 1~2 battery
②	B-	/	Connect to battery in cabinet
③	P+	/	Connect to inverter
④	P-	/	Connect to inverter
⑤	P+	/	Connect to another B-BOX or Combiner box
⑥	P-	/	Connect to another B-BOX or Combiner box
⑦	Grounded		Connect the grounded cable from battery.
⑧	CAN port RS485	CAN	Connect to inverter CAN port. Update and maintenance
⑨	Dry contact		Dry contact application, output alarm info.
⑩	Run led	Run	Indicate the Plus is running status

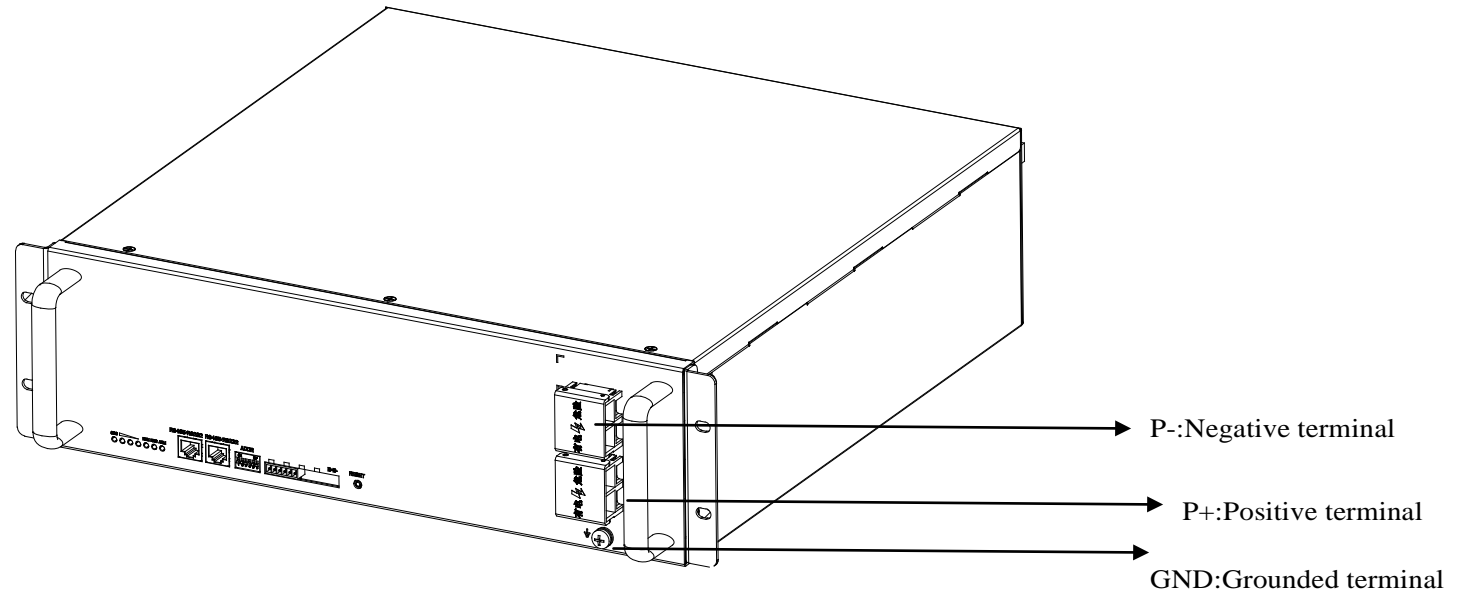
3 Cable outlet of cabinet



Compare list

No.	Interface	Mark	Function
①	CAN	CAN	CAN communication cable
②	B+	B+	Positive cable from another B-BOX
③	B+	B+	Positive cable from inverter
④	B-	B-	Negative cable from inverter
⑤	B-	B-	Negative cable from another B-BOX

4 B-Plus2.5 interface and terminal introduction



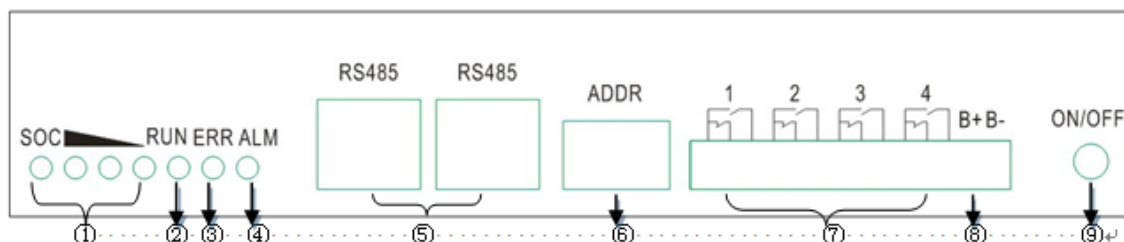


Table 1 Display and communicate interface

No.	Interface	Mark	Function
①	SOC LED	SOC	Indicates State of capacity of battery
②	RUN LED	RUN	Indicates the B-Plus is running status
③	ERR LED	ERR ADDR	Indicates error status
④	ALM LED	Alarm	Indicates alarm status
⑤	RJ45 terminal	RS485	Communication ports
⑥	Address	ADDR	When parallel connection, this is for setting address.
⑦	Alarm relay	1.2.3.4	Unused
⑧	Test terminal	B- B+	Measures battery voltage when testing.
⑨	ON/OFF	ON/OFF	Activating of battery when no external powers add on battery.

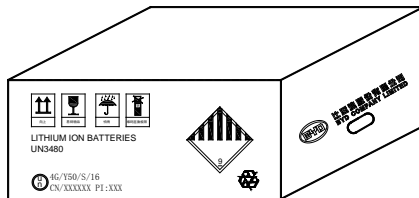
5 Preparations






5.1 Installation notice

- a) Battery installation location should be away from heat sources and sparks should be avoided. The safety distance should be more than 0.5m.
- b) Battery connection cables should be as short as possible, to prevent excessive line pressure drop.
- c) Batteries with different capacity, different P/N or different manufacturers are not allowed for connection.
- d) Before conducting the battery, the battery positive and negative poles need to be carefully checked as well to ensure correct installation.
- e) The mounting floor should be flat.

5.2 Package information and system configuration list

The cabinet and battery are packaged separately with cartons, the components are supplied with the cabinet or battery package. Before installation, installers should read the system configuration list.



No.	Item Description	Qty	Purpose	Picture
1	Anchor bolt	4	To allow distance from cabinet to ground.	
2	User Manual	1	System information, operating instructions and warranty items.	\
3	Installation Manual	1	System installation guidance	\
No.	Item Description	Qty	Purpose	Picture
1	Positive cable	1	Battery P+ connection	
2	Negative cable	1	Battery P- connection	
3	GND	1	Connection of battery grounded terminal	
4	Communication cable	1	Battery RS485 port connection	

5.3 Configuration list

Type	B-BOX 2.5	B-BOX 5.0	B-BOX 7.5	B-BOX 10.0
B-Box cabinet	1	1	1	1
B-Plus2.5	1	2	3	4
User manual	1	1	1	1
Positive cable	1	2	3	4
Negative cable	1	2	3	4
Communicate cable	1	2	3	4
Grounded cable	1	2	3	4

5.4 Installation Tools



Cross screwdriver

M3~M10



Flat tip screwdriver

M3~M6



Sockets spanner



Diagonal cutters



Adjustable wrench



Knife

5.5 Personal protective equipment



Insulated gloves

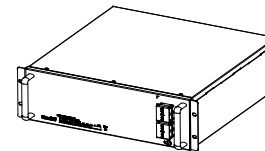
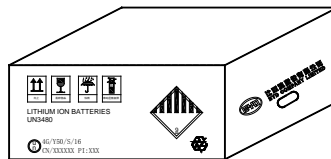
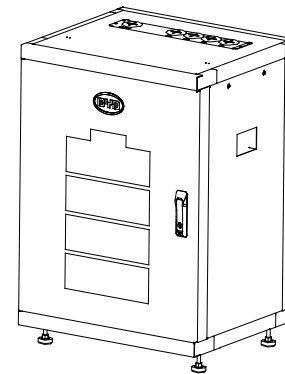
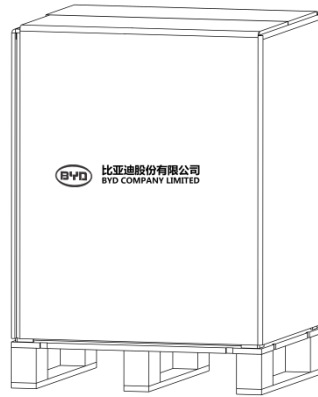


Safety shoes

6 Installation

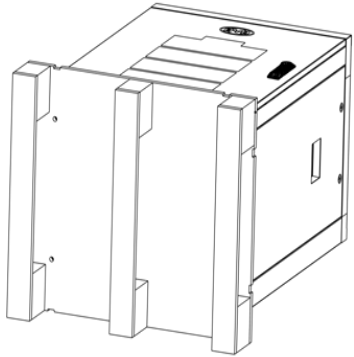
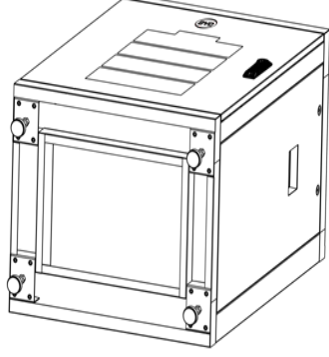
6.1 Opening the package

Tools: Knife



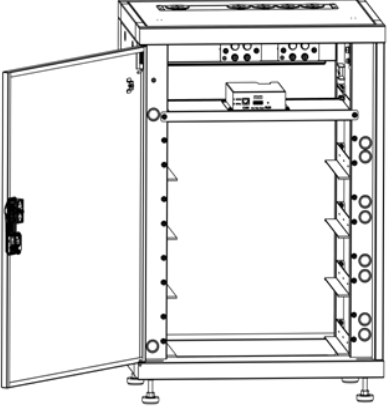
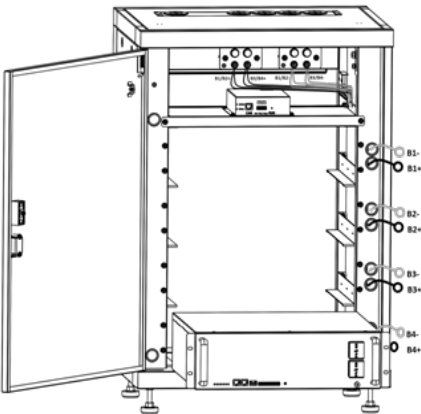
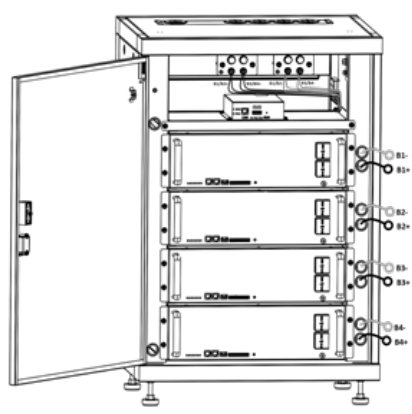
6.2 Disassembling the pallet & anchor bolt installation

Tools: Adjustable spanner fixed torque: 10 ± 1 Nm

 <p>Figure 6.106</p>	
<p>Lay down the cabinet, put some protections on the ground to avoid scratches.</p>	<p>Take away the pallet and four screws that installed on the root of the pallet.</p> <p>Install the 4pcs anchor bolt into the four hole in bottom of cabinet.</p>

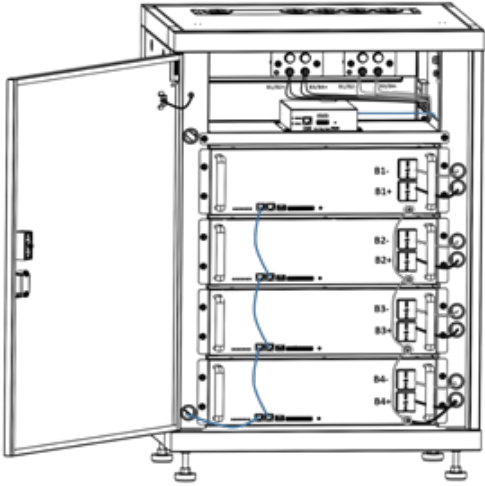
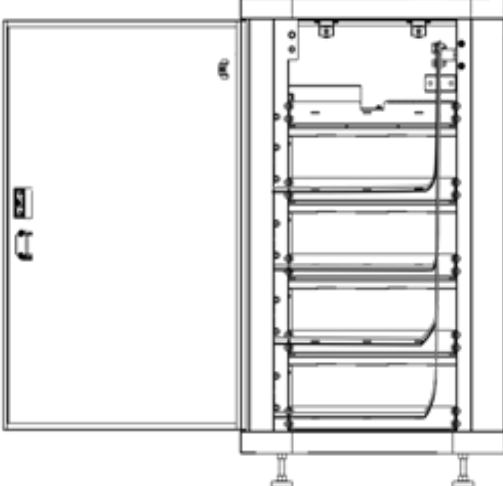
6.3 Battery installation

Tools: Cross screwdriver

		
<p>Move the cabinet to the installation place, prepare to install battery.</p>	<p>Open the door, take away the screws of the battery storey and front panel. Push the battery into battery storey from the bottom, one cabinet can install maximum 4pcs batteries</p>	<p>Fix all batteries with screws. Finish battery installation.</p>

6.4 Connection of cables

Tools: Cross screwdriver

	
<p>Remove the left side panel.</p> <p>Install the cables, install the positive cable to B+ DC BUS, install the negative to B- DC BUS.</p>	<p>Tie the cable tight and pass the cables through the holes next to the batteries.</p>

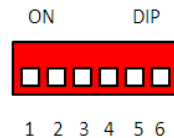
7 Battery address set up

7.1 “ADDR” switch introduction

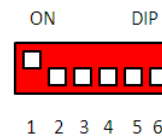
Function: For communication between battery and BMU. BMU will communicate with external equipment by using CAN communication.

Each DIP switch definition:

There are 6 bit switches, keep the switch on down side means “0”, turn up the switch to “ON” means “1”.

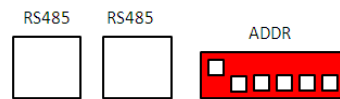


Address: 000000

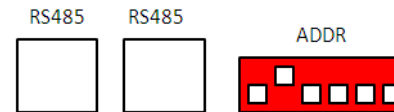


Address: 100000

For example: when two battery in using, “ADDR” setting:



No.1 battery address: 100000



No.2 battery address: 010000

For address setting, please refer to the configuration list in next page.

Note: Make sure of the highest address of B-Plus2.5 connect to BMU.

7.2 Battery address setting list (from 1~32 batteries):

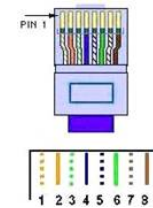
Battery No.	Address	Battery No.	Address
1	100000	17	100010
2	010000	18	010010
3	110000	19	110010
4	001000	20	001010
5	101000	21	101010
6	011000	22	011010
7	111000	23	111010
8	000100	24	000110
9	100100	25	100110
10	010100	26	010110
11	110100	27	110110
12	001100	28	001110
13	101100	29	101110
14	011100	30	011110
15	111100	31	111110
16	000010	32	000001

8 Connection to inverter

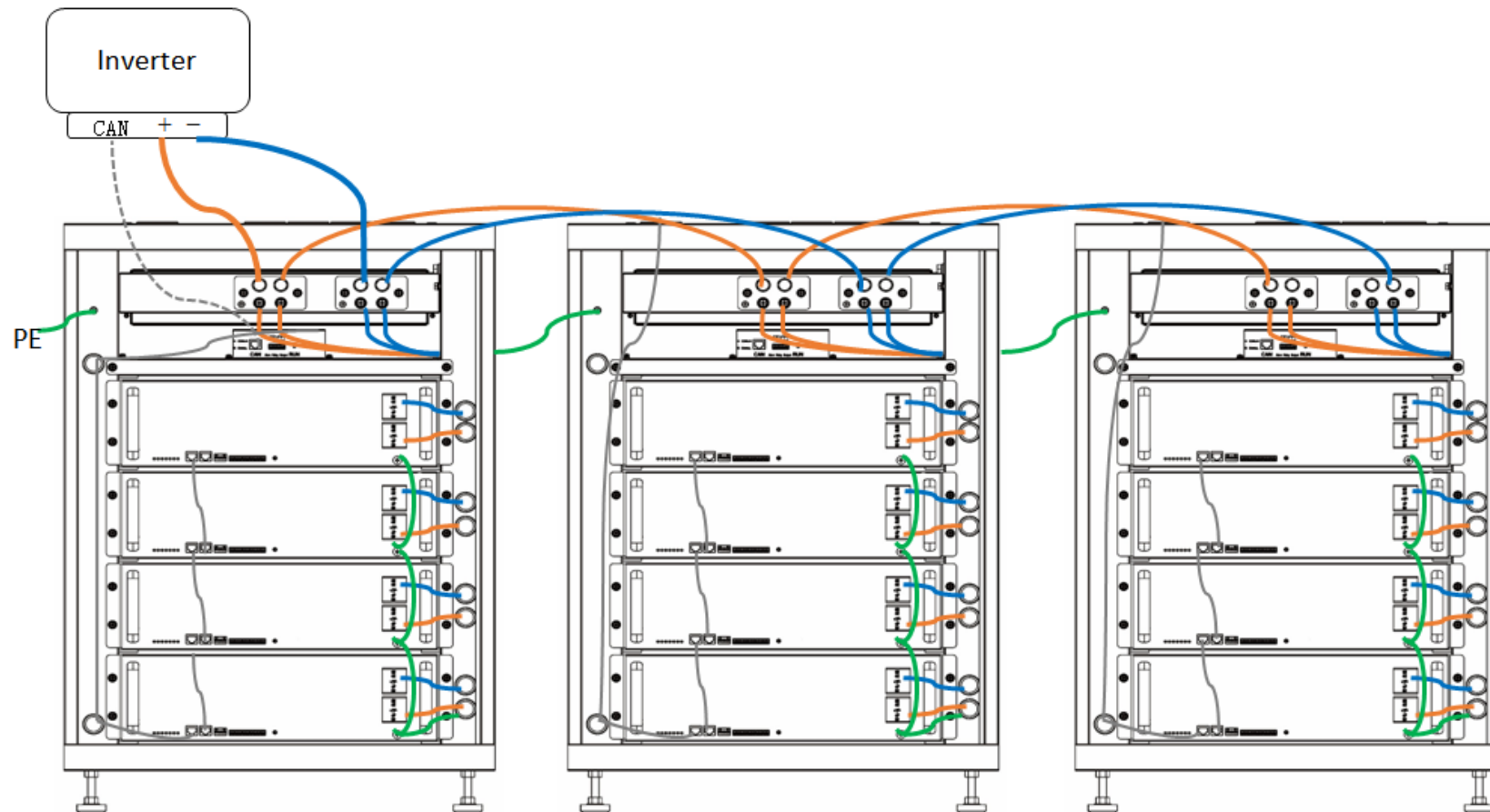
8.1 CAN cable connection

RJ45 PIN define

	B-BOX	SMA	GOODWE	SOLAX	VICTRON
CAN H	4	4	4	1	7
CAN L	5	5	5	2	8



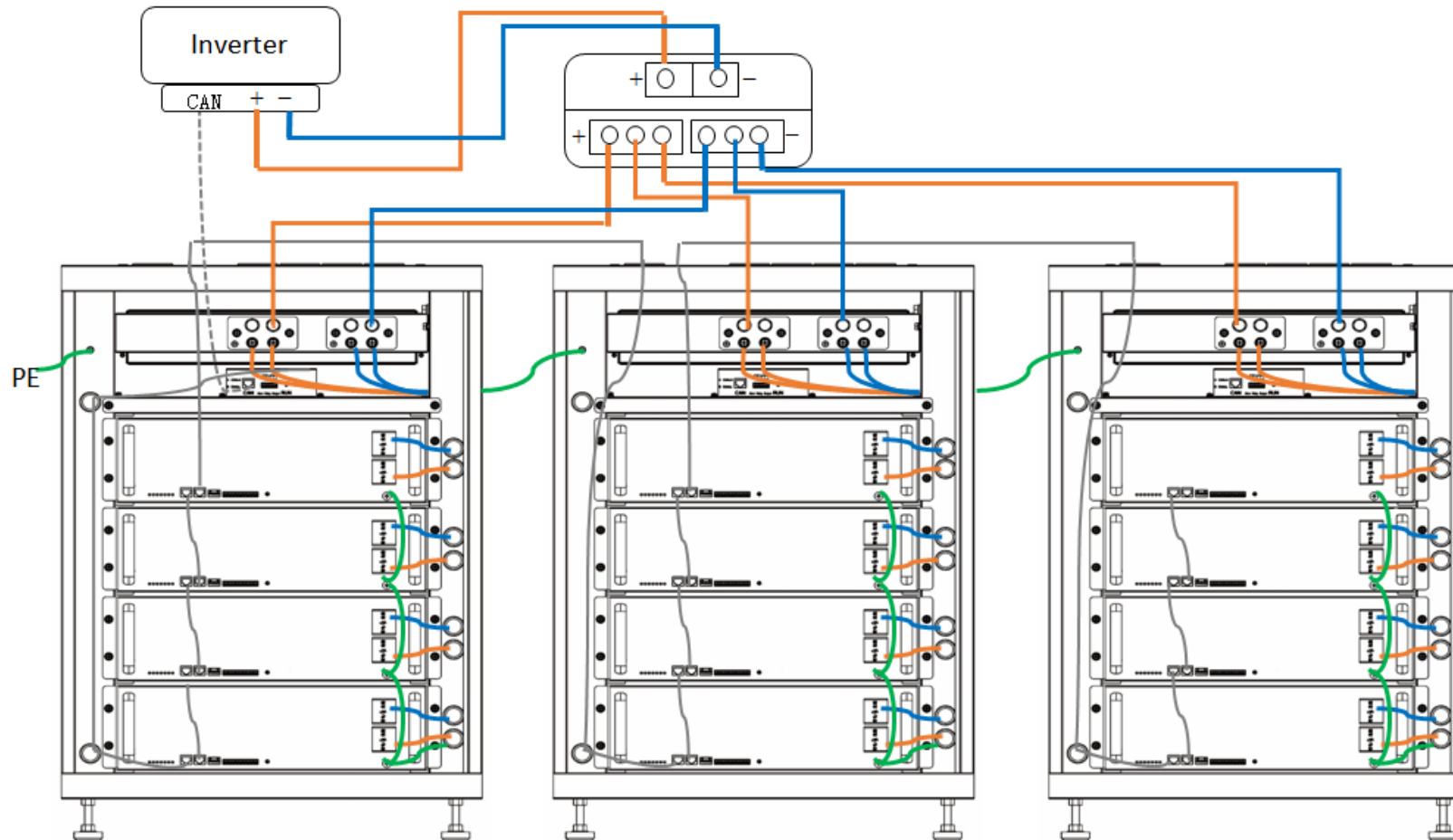
When installers attempt “CAN” ports connections between B-Box and inverter, please refer to below drawing.



8.2 Power cable connection

Tools: Cross screwdriver, fixed torque: $25 \pm 2.5 \text{ Nm}$

Remark: Each rack's negative cables should be fastened with the belt, and the cable length between each cabinet and inverter shall be the same. Be careful not to reverse connection.



9 Starting system

Notice: Before activating the system, please make sure that you:

- ✓ Confirm all the batteries are powered OFF.
- ✓ Confirm all power cables are connected correctly and securely.
- ✓ Confirm all communication cables are connected correctly and securely.

9.1 System activating procedures when B-Box connect to SMA Sunny Island

(1) Start B-Box

Activate all of the B-Plus 2.5

Tips: Pressing “ON/OFF” button one second will start the B-Plus, according to the number of inverters in the following table, activate the batteries as fast as possible within 8 seconds

	Inverter:1~2PCS	Inverter:3~4PCS	Inverter:5~7PCS	Inverter:8~9PCS
The amount of battery	1	2	3	4

Once start, the LED lights of B-Plus 2.5 will flash in various forms according to the battery status, as below:

LED status when normal start

Item	LED	Status
1	Run	Green
2	SOC	More than one is green. Slow blink is charging and fast blink is discharging. The merry-go-round means no communication.
3	ERROR	OFF
4	Alarm	OFF

	Status(display interval 2S)	Definition
LED(BMU)	Blinks 1 time	Inverter not connected
	Blinks 2 time	Battery not connected
	Blinks 3 time	Battery disconnected
	Blinks 4 time	Battery failure

Remark:

Slow blink: indicator light is on and off every 1s (0.5Hz).

Fast blink: indicator light is on and off every 0.25s (2HZ)

SOC status and indicate

Item	Status	Indicate
1	Four lights are all normally on	Capacity is 100%-75% (including)
2	The last three lights are normally on	Capacity is 74%-50% (including)
3	The last two lights are normally on	Capacity is 49%-25% (including)
4	The last one light is normally on	Capacity is 24%-1% (including)

(2) Switching on the Sunny Island;

Procedure:

- For systems with one Sunny Island, press the "On" button on the Sunny Island.

☑ the inverter LED on each Sunny Island inverter is glowing orange and the Sunny Island inverters are in standby.

(3) Start the inverter;

Procedure:

- Press the start-stop button on the Sunny Island and hold it until an acoustic signal sounds. Or press and hold the button on the Sunny Remote Control until an acoustic signal sounds. The inverter LED on each Sunny Island is glowing green.

(4) Set up battery parameters on SRC of inverter;

Please refer to the "Battery Parameter setting" table in Appendix 1.

Remark: If the battery capacity is greater than or equal to 200AH, according to the B-Box10.0 parameter settings

(5) System is running.

9.2 System activating procedures when B-Box connects to GOODWE inverter

(1) Download the APP on user's cell phone and open the home page;

(2) Start B-Box;

Press the "ON/OFF" button on front panel of B-Plus2.5;

Tips: Press one second will start the B-Plus;

Once start, the LED lights of B-Plus 2.5 will flash in various forms according to the battery status, as below:

LED status when normal start

Item	LED	Status
1	Run	Green
		More than one is green.
2	SOC	Slow blink is charging and Fast blink is discharging. The merry-go-round means no communication.
3	ERROR	OFF
4	Alarm	OFF

	Status(display interval 2S)	Definition
LED(BMU)	Blinks 1 time	Inverter not connected
	Blinks 2 time	Battery not connected
	Blinks 3 time	Battery disconnect
	Blinks 4 time	Battery failure

Remark:

Slow blink: indicator light is on and off every 1s (0.5Hz).

Fast blink: indicator light is on and off every 0.25s (2HZ)

SOC status and indicate		
Item	Status	Indicate
1	Four lights are all normally on	Capacity is 100%-75% (including)
2	The last three lights are normally on	Capacity is 74%-50% (including)
3	The last two lights are normally on	Capacity is 49%-25% (including)
4	The last one light is normally on	Capacity is 24%-1% (including)

(3) Go to the home page of the APP, enter into the Battery Settings page, select “BYD B-BOX” battery, then select “NEXT” until the last page, finally select “Start”.

Remark: If the installed capacity is greater than or equal to 10.0KWh, pls choose the product model as "BYD B-BOX 10" in the App

(4) System is running.

9.3 System activating procedures when B-Box connects to Victron inverter

- (1) Start inverter;
- (2) Set the battery DOD at a minimum of 5% on-grid; Set the battery DOD at a minimum of 10% off-grid.
- (3) Start B-BOX;

Press the “ON/OFF” button on front panel of B-Plus 2.5;

Tips: Press “ON/OFF” button one second will start B-Plus, activate the batteries as fast as possible within 8 seconds according to the number of inverters in the following table.

	Inverter:1~2PCS	Inverter:3~4PCS	Inverter:5~7PCS	Inverter:8~9PCS
The amount of battery	1	2	3	4

Once start, the LED lights of B-Plus 2.5 will flash in various forms according battery status, as below:

LED status when normal start

Item	LED	Status
1	Run	Green More than one is green.
2	SOC	Slow blink is charging and fast blink is discharging. The ferry-go-round means no communication.
3	ERROR	OFF
4	Alarm	OFF

	Status(display interval 2S)	Definition
LED(BMU)	Blinks 1 time	Inverter not connected
	Blinks 2 time	Battery not connected
	Blinks 3 time	Battery disconnect
	Blinks 4 time	Battery failure

Remark:

Slow blink: indicator light is on and off every 1s (0.5Hz).

Fast blink: indicator light is on and off every 0.25s (2HZ)

SOC status and indicate

Item	Status	Indicate
1	Four lights are all normally on	Capacity is 100%-75% (including)
2	The last three lights are normally on	Capacity is 74%-50% (including)
3	The last two lights are normally on	Capacity is 49%-25% (including)
4	The last one light is normally on	Capacity is 24%-1% (including)

(4) System is running.

9.4 System activating procedures when B-Box connects to Solax inverter

(1) Start B-Box

Press the “ON/OFF” button on front panel of B-Plus 2.5;

Tips: Press one second will start B-Plus;

Once start, the LED lights of B-Plus 2.5 will flash in various forms according to battery status, as below:

LED status when normal start

Item	LED	Status
1	Run	Green
2	SOC	More than one is green. Slow blink is charging and fast blink is discharging. The ferry-go-round means no communication.
3	ERROR	OFF
4	Alarm	OFF

	Status(display interval 2S)	Definition
LED(BMU)	Blinks 1 time	Inverter not connected
	Blinks 2 time	Battery not connected
	Blinks 3 time	Battery disconnect
	Blinks 4 time	Battery failure

Remark:

Slow blink: indicator light is on and off every 1s (0.5Hz).

Fast blink: indicator light is on and off every 0.25s (2HZ)

SOC status and indicate

Item	Status	Indicate
1	Four lights are all normally on	Capacity is 100%-75% (including)
2	The last three lights are normally on	Capacity is 74%-50% (including)
3	The last two lights are normally on	Capacity is 49%-25% (including)
4	The last one light is normally on	Capacity is 24%-1% (including)

(2) Activate inverter;

(3) Go to the home page of the APP, and enter into Charger Settings page, select “Battery Type Lithium”, then select “Min Capacity” setting 20%, finally select “Battery awoken”. Choose “YES” to complete the battery parameter settings.

(4) System is running;

10 Stopping system

Note:

1. Before stopping the system, shut down the system in the following orders:

AC Load=>PV=>Inverter=>Battery

2. After stopping the system, please ensure that you:

Confirm all the batteries are powered OFF.

Check all the LEDs are OFF.

Check that the inverter has powered off.

Appendix 1

SMA charger min capacity

Parameter setup for B-BOX2.5

Charging the battery - usage through battery backup system without increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	50
262.01ProtResSOC	3
262.02BatResSOC	10

Charging the battery - usage through battery backup system with increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	50
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.03BUResSOC	0
262.04PVResSOC	8
262.05MinSlfCsmpSOC	75

Charging the battery - usage through system for increased self-consumption without a battery backup grid

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	50
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6

262.04PVResSOC	8
262.03BUREsSOC	0
262.05MinSlfCsmplSOC	75

Parameter setup for B-BOX 5.0

Charging the battery - usage through battery backup system without increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	100
262.01ProtResSOC	3
262.02BatResSOC	7

Charging the battery - usage through battery backup system with increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	100
261.01SlfCsmplncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4
262.03BUREsSOC	0
262.04PVResSOC	6
262.05MinSlfCsmplSOC	80

Charging the battery - usage through system for increased self-consumption without a battery backup grid

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	100
261.01SlfCsmplncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4

262.04PVResSOC	6
262.03BUREsSOC	0
262.05MinSlfCsmpSOC	80

Parameter setup for B-BOX7.5

Charging the battery - usage through battery backup system without increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	150
262.01ProtResSOC	3
262.02BatResSOC	6

Charging the battery - usage through battery backup system with increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	150
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4
262.03BUREsSOC	0
262.04PVResSOC	4
262.05MinSlfCsmpSOC	85

Charging the battery - usage through system for increased self-consumption without a battery backup grid

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	150
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4

262.04PVResSOC	4
262.03BuresSOC	0
262.05MinSlfCsmpSOC	85

Parameter setup for B-BOX10.0

Charging the battery - usage through battery backup system without increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	200
262.01ProtResSOC	3
262.02BatResSOC	6

Charging the battery - usage through battery backup system with increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	200
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4
262.03BuresSOC	0
262.04PVResSOC	4
262.05MinSlfCsmpSOC	85

Charging the battery - usage through system for increased self-consumption without a battery backup grid

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	200
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4

262.04PVResSOC	4
262.03BUREsSOC	0
262.05MinSlfCsmplSOC	85

Parameter setup for B-BOX in off-grid

Protection for the Battery

Parameters	Recommended Value
223.05 BatPro1Soc	12%
223.06 BatPro2Soc	12%
223.07 BatPro3Soc	3%

Gen Autostart Control

Parameters	Recommended Value
235.03 GnSocTm1Str	17%
235.04 GnSocTm1Stp	35%

Parameter setup for B-BOX7.5**Three-phase****Charging the battery - usage through battery backup system without increased self-consumption**

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	150
262.01ProtResSOC	3
262.02BatResSOC	10

Charging the battery - usage through battery backup system with increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	150
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.03BuresSOC	0
262.04PVResSOC	8
262.05MinSlfCsmpSOC	75

Charging the battery - usage through system for increased self-consumption without a battery backup grid

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	150
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.04PVResSOC	8
262.03BuresSOC	0
262.05MinSlfCsmpSOC	75

Parameter setup for B-BOX10.0**Charging the battery - usage through battery backup system without increased self-consumption**

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	200
262.01ProtResSOC	3
262.02BatResSOC	10

Charging the battery - usage through battery backup system with increased self-consumption

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	200
261.01SlfCsmplncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.03BuresSOC	0
262.04PVResSOC	8
262.05MinSlfCsmplSOC	75

Charging the battery - usage through system for increased self-consumption without a battery backup grid

Parameters	Setup value
003.07Batt Typ	Li Lon_Ext-BMS
003.10Batt Cpynom	200
261.01SlfCsmplncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.04PVResSOC	8
262.03BuresSOC	0
262.05MinSlfCsmplSOC	75

Appendix 2

Solax charger min capacity

Product	Min capacity
B-BOX 2.5	20%
B-BOX 5.0	15%
B-BOX 7.5	15%
B-BOX 10.0	10%
B-BOX 12.8	10%