



Battery-Box Pro 13.8 Installation Guidance

Rev.1.0
Apr.2018

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

1 Introduction

Thank you for choosing BYD products. We are committed to providing you with quality and reliable after sales service.

To protect users and the product itself, please kindly read this manual carefully which provides detailed information for product features, structures, operating standards, maintenance and troubleshooting.

Note:

This manual can't be taken as basis of requirement for BYD.

BYD reserve the final explanation rights of this manual.

Skilled personnel recognized:

This manual and the tasks and procedures described here are intended to be used by skilled workers only. A skilled worker is defined as a trained and qualified electrician or installer who has all of the following skills and experience:

Knowledge of the function principles and operation of on-grid systems.

Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.

Knowledge of the installation of electrical devices

Knowledge of and adherence to this manual and all safety precautions and best practices.

2 Information in this Guide

2.1 About this guide

This is the installation guide for the BYD Battery Box Pro product -- Battery-Box Pro 13.8. Users of this device or installers must refer to the installation guide to install and use the product correctly.

2.2 Target Group

This installation guide applies only to the BYD Battery Box Pro product--Battery-Box Pro 13.8.

2.3 Additional Information

Specification of the product will change without any notice to customers for the purpose of system improvement.

2.4 Symbols Used

Symbols meanings:



CAUTION:

CAUTION represents hazardous situations which can cause light injury, if ignored.



NOTICE:

NOTICE represents the situations which can cause damage to property, if ignored.



INFORMATION:

INFORMATION provides useful tips for optimum installation and operation of the product.

3 Safety

3.1 Warnings and Notification

Installation environment requirements: Battery-Box Pro 13.8 is designed for household purposes. For installation, it must be installed in a location complying with IP20 regulation. If the Installation location does not comply with IP20, this may cause product failure and it will not be guaranteed for any related accident or damage.

3.2 Safety Guidelines



CAUTION:

Li-Ion battery (energy storage unit) inside. When Installing the system, do not intentionally make a short connection between the positive (+) and negative (-) terminals of the Battery-Box Pro 13.8 with a metallic object.

All work on the Battery-Box Pro 13.8 and electrical connections must be carried out by qualified personnel only.

Battery-Box Pro 13.8 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/or 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 Battery-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.

The Battery-Box LV system can be installed at altitudes of up to 2000m above Mean Sea Level.



CAUTION:

Due to high weight of Battery-Box Pro 13.8, please use strong packaging and safety protection equipment during transportation, to ensure safety and avoid accidental damage.

Can't use the deformation of the battery.

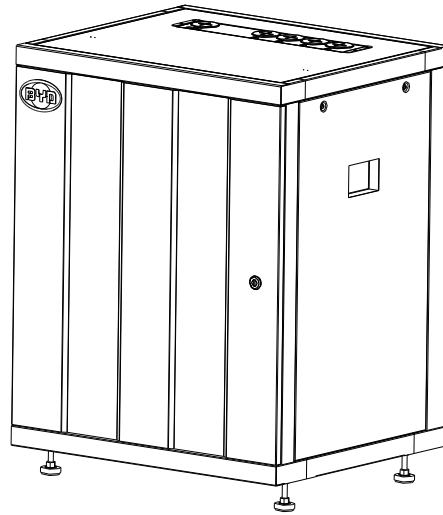
By checking to verify the installation Settings are correct.

The installation should be clean, flat, dry and waterproof etc.

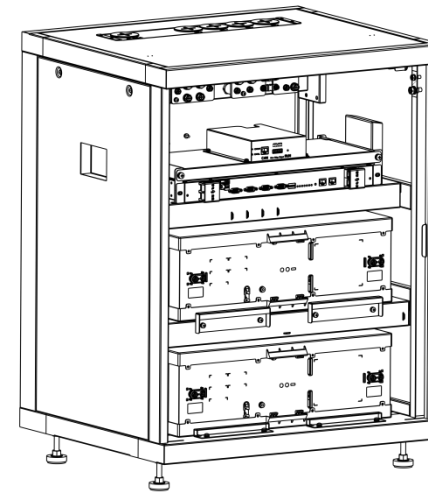
4 Product Overview

4.1 Product Introduction

BYD Battery Box Pro products --Battery-Box Pro 13.8 as the energy storage parts can be used as off-grid & on-grid energy storage system. It is recommended not to use this device for other than the purpose described in this guidance. The substitute use of this product, random change, and use of components other than sold or recommended by BYD will nullify the product guarantee. It also supports parallel connection between Battery-Box Pro 13.8 with maximum number 32, the total capacity can reach 409kWh. The system is ideal easy installation and maintenance.



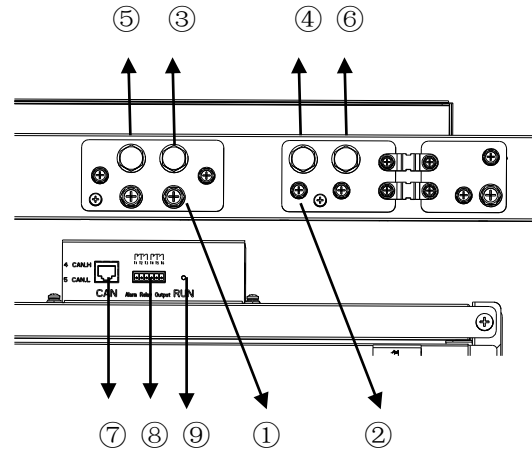
Overview of Battery-Box Pro 13.8 cabinet



Internal view of Battery-Box Pro 13.8 cabinet

4.2 Terminal introduction

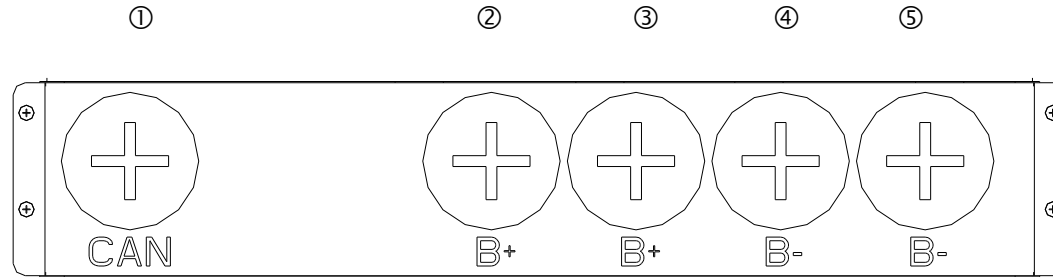
4.2.1 Cabinet internal terminal introduction



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 Battery-Box or Combiner box
⑥	P-	/	Connect to another Battery-Box or Combiner box
⑦	CAN port	CAN	Connect to inverter CAN port.
	RS485		Update software
⑧	Dry contact		Dry contact application, output alarm info.
⑨	Run led	Run	Indicate the Battery-Box running status

4.2.2 Cable outlet of cabinet

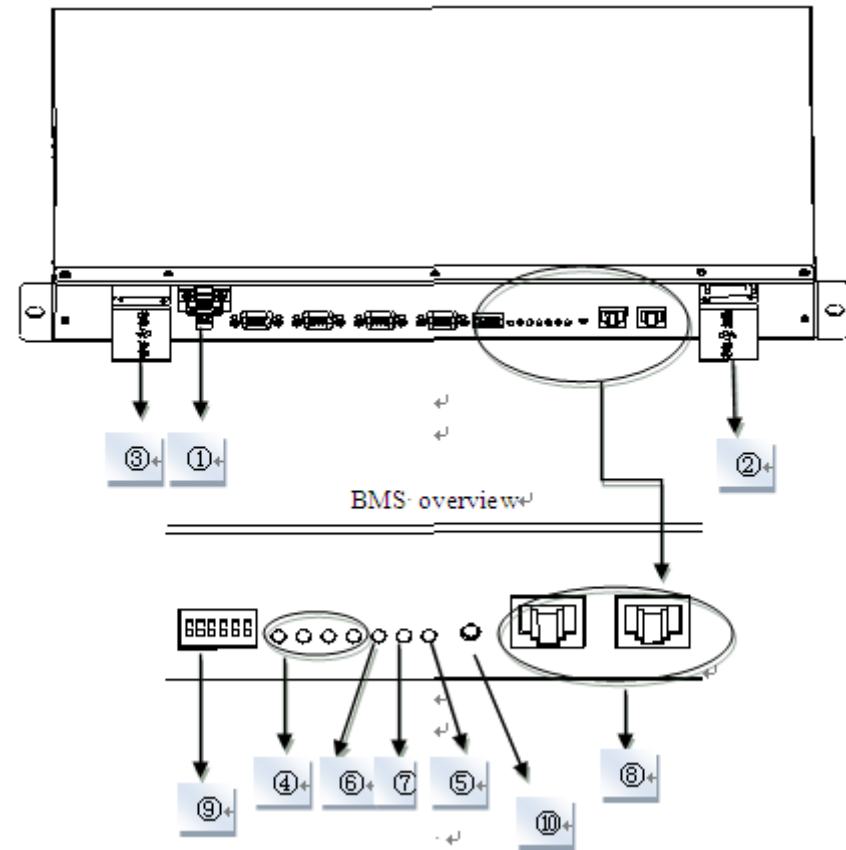


Top through-holes

Compare list of through-holes:

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

4.2.3 BMS interface and terminal introduction



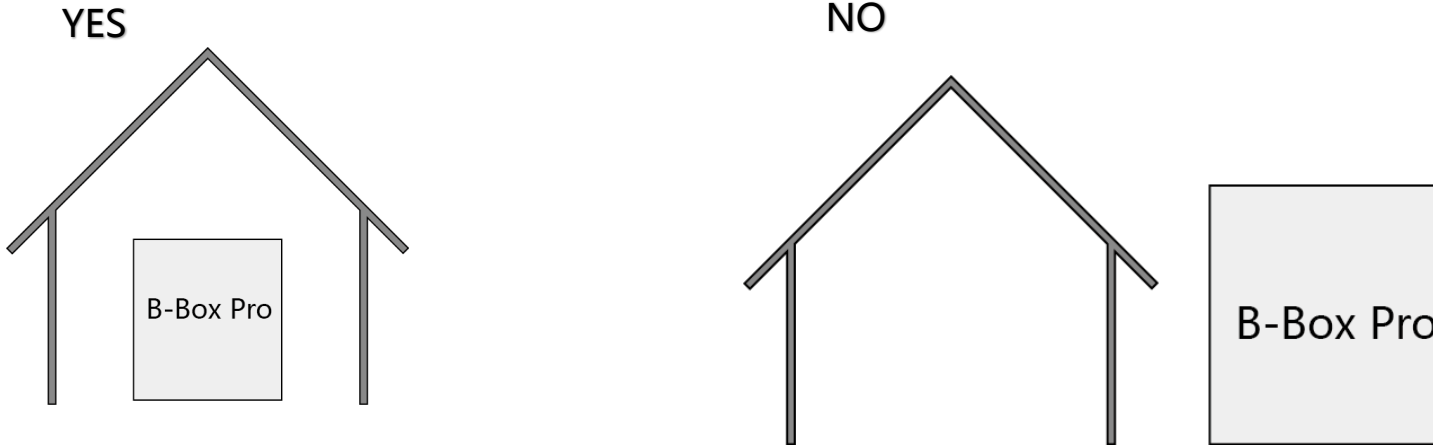
Display and communicate interface

No.	Interface	Mark	Function
①	B+	B+	Connect battery positive cable to power the BMS
②	B-	B-	Positive terminal of BMS
③	P-	P-	Negative terminal of BMS
④	SOCLED	SOC	Indicate State of capacity of battery
⑤	RUN LED	RUN	Indicate the Battery is in running status
⑥	ERR LED	ERR ADDR	Indicate error status
⑦	Alarm LED	Alarm	Indicate alarm status
⑧	RJ45 terminal	RS232/RS485	Communication ports
⑨	Address	ADDR	When parallel connection, needs setting address.
⑩	Reset(ON/OFF)	RESET(ON/OFF)	Activating battery when no external power add to battery.

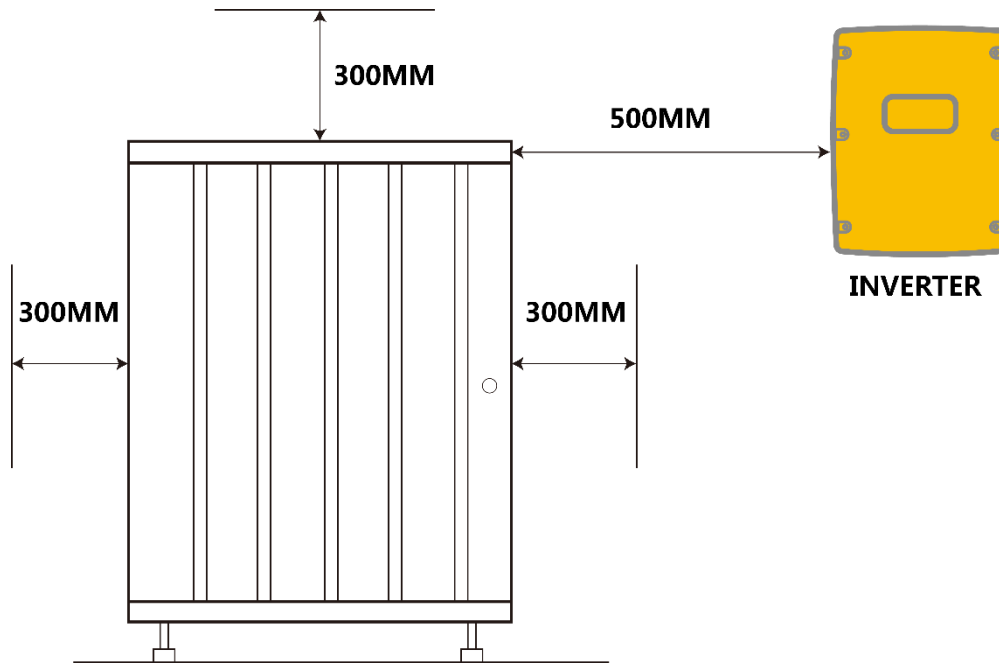
5 Installation

5.1 Installation notice

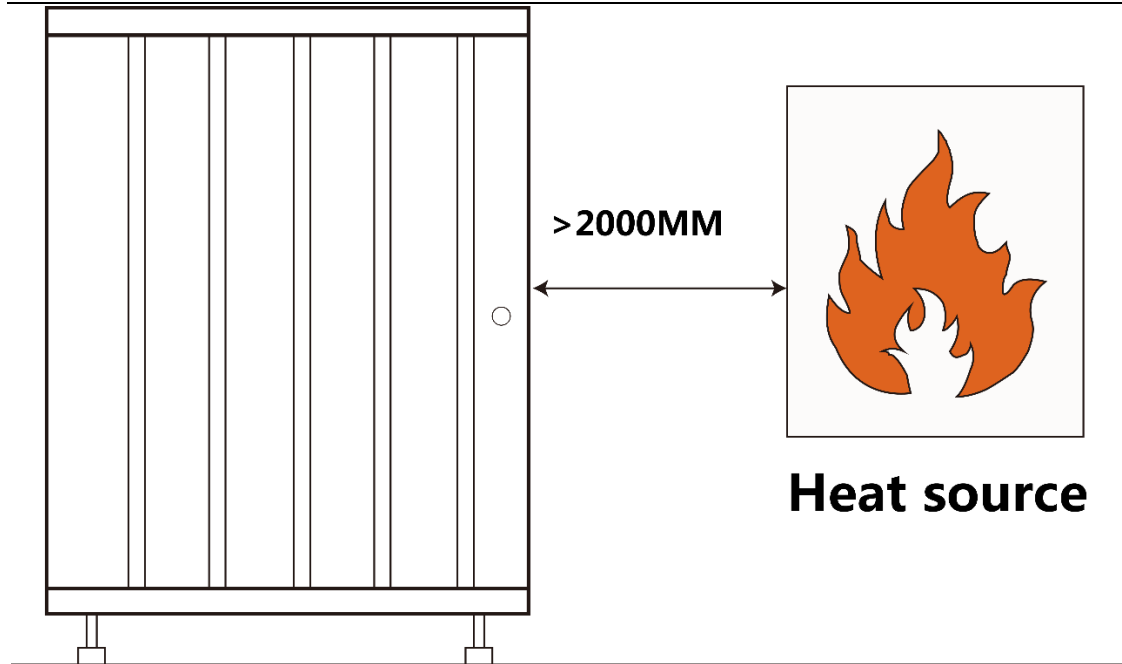
- a) There must be no highly flammable or explosive materials nearby.
- b) Battery installation location should be away from heat sources and sparks should be avoided. The safety distance should be more than 2m.
- c) Battery connection cables should be as short as possible, to prevent excessive line pressure drop.
- d) Batteries with different capacity, different types of products or different manufacturers are not allowed for connection.
- e) Before conducting the battery, the battery positive and negative poles need to be checked carefully to ensure correct installation.
- f) The installation position shall be in a flat place. Use tools with insulated handles.
- g) Pre-assembled integrated Battery-Box shall not be installed —
 - (i) in ceiling spaces;
 - (ii) inside wall cavities;
 - (iii) on roofs not specifically deemed suitable;
 - (iv) areas of access/egress;
 - (v) under stairways; or
 - (vi) under access walkways.



Notice: The BYD Battery-Box Pro must be installed indoors.



Recommended clearances for the left, right, top of the product is shown in the figure for the proper ventilation and installer convenience.

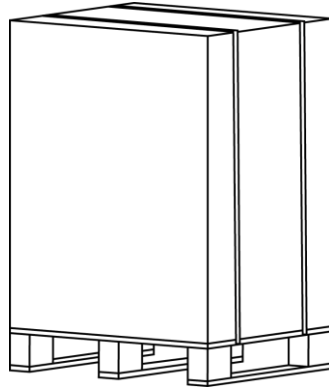


⚠ CAUTION

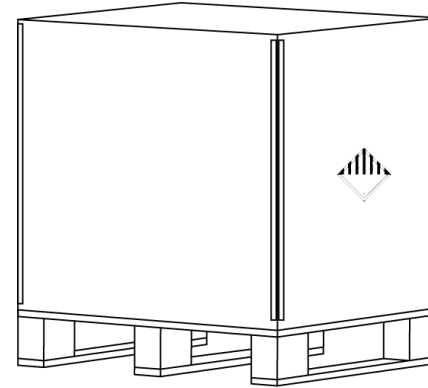
If the ambient temperature is outside the operating range, the battery pack stops operating to protect itself. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

5.2 Package Information

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



Battery-Box Pro 13.8 Cabinet



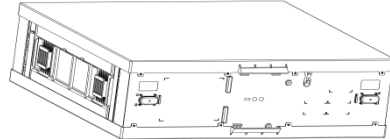
B-Plus 13.8

5.2.1 Configuration list

Please install Battery-Box Pro 13.8 according to the following table.



Part list of B-Plus 13.8

(Remark: This part list is only for one Battery-Box Pro 13.8.)

No.	Item Description	Qty	Purpose	Picture
1	Battery module	2	Installed into cabinet	

Part list of cabinet

(Remark: This part list is only for single system cabinet.)

No.	Item Description	Qty	Purpose	Picture
1	Anchor bolt	4	To allow distance from cabinet to ground.	
2	Black cable	1		
3	User Manual	1	System information, operating instructions and warranty items.	\
4	Installation short instruction	1	System installation guide	\
5	Keys	2	The keys are inside package and around the cabinet.	\

5.3 Tools

Installation tools list



Cross screwdriver

M3~M10



Flat tip screwdriver

M3~M6



Sockets spanner



Diagonal cutters



Adjustable wrench



Knife

5.4 Personal protective equipment



Insulated gloves



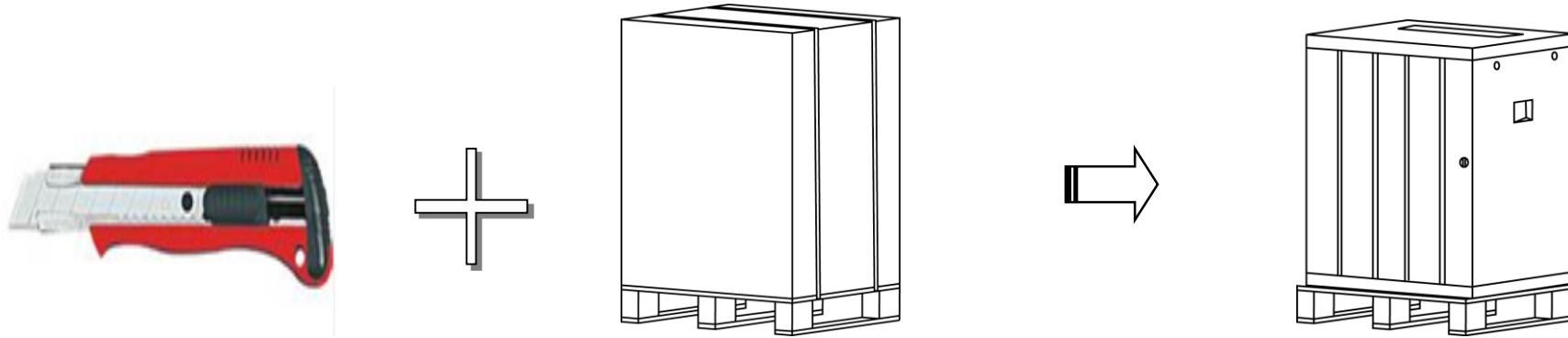
Safety shoes

5.5 Installation

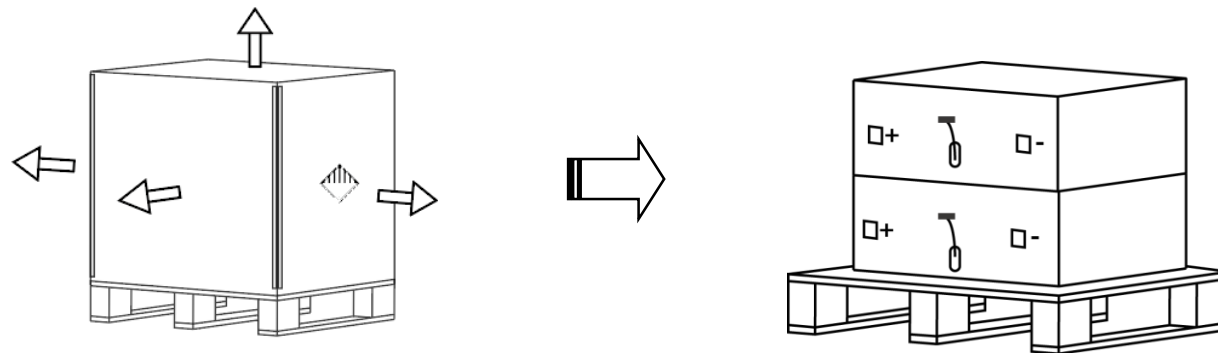
5.5.1 Unpacking

Tools: Knife to cut carton, remove all boards.

Note: Don't lose keys



Tools: Diagonal cutters and flat tip screwdriver

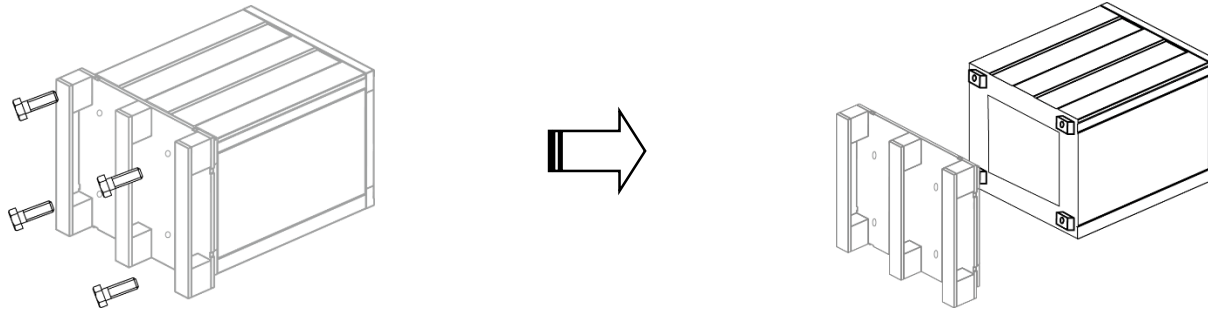


5.5.2 Disassemble the pallet

- Lay down the cabinet, in order to prevent scratching the cabinet, please use some protection on the ground.
- Take away the four screws which installed on the basis of the pallet.

c) Take away the pallet

Tools: Adjustable Spanner



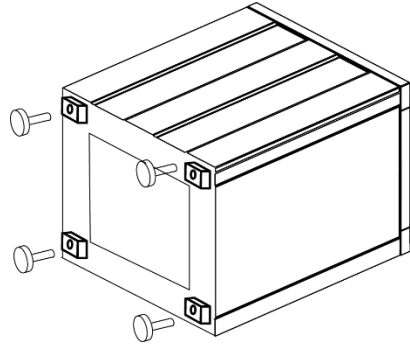
d) Take the battery out of the wooden case, and put the two battery modules a certain distance from the cabinet.

5.5.3 Anchor bolt installation

Install the 4pcs anchor bolts into the four holes at bottom of cabinet.

Tools: Adjustable Spanner. Fixed torque: $10\pm 1\text{Nm}$

- i. Install the anchor bolt, turn the anchor bolt to the certain height;
- ii. Using Spanner to turn the second screw to lock the anchor bolt;
- iii. Move the first screw to the cabinet bottom closely;



5.5.4 Battery installation

Tools: Cross screwdriver

Install steps:

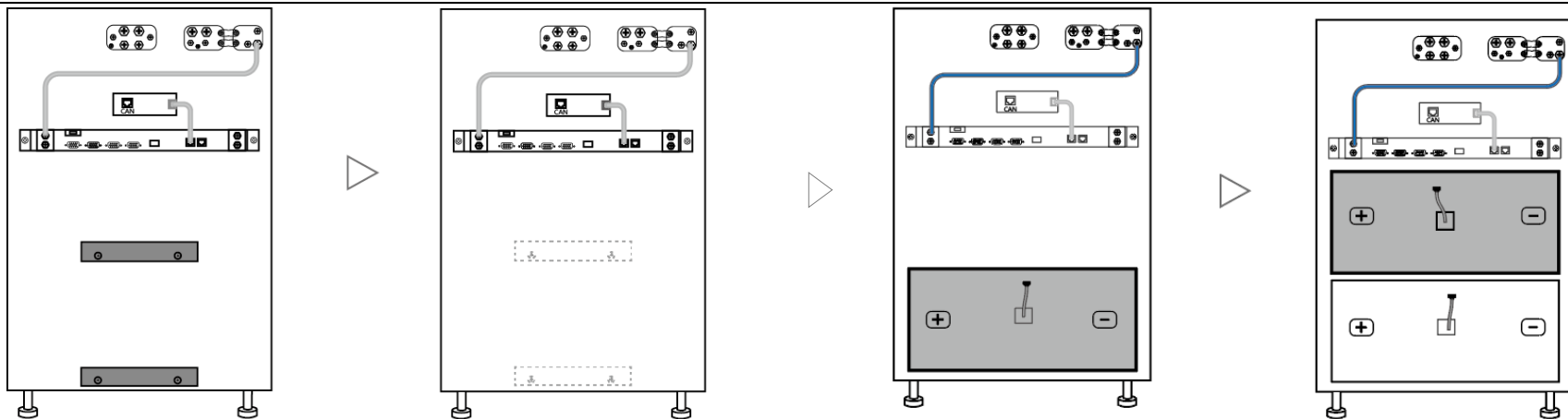
- iv. Move the cabinet to the installation location, prepare to install battery.
- v. Open the door; take away the part bag from the battery store.
- vi. Disassemble the dam-board from cabinet.
- vii. Push the battery module into cabinet.
- viii. Assemble the dam-board on cabinet.

Note:

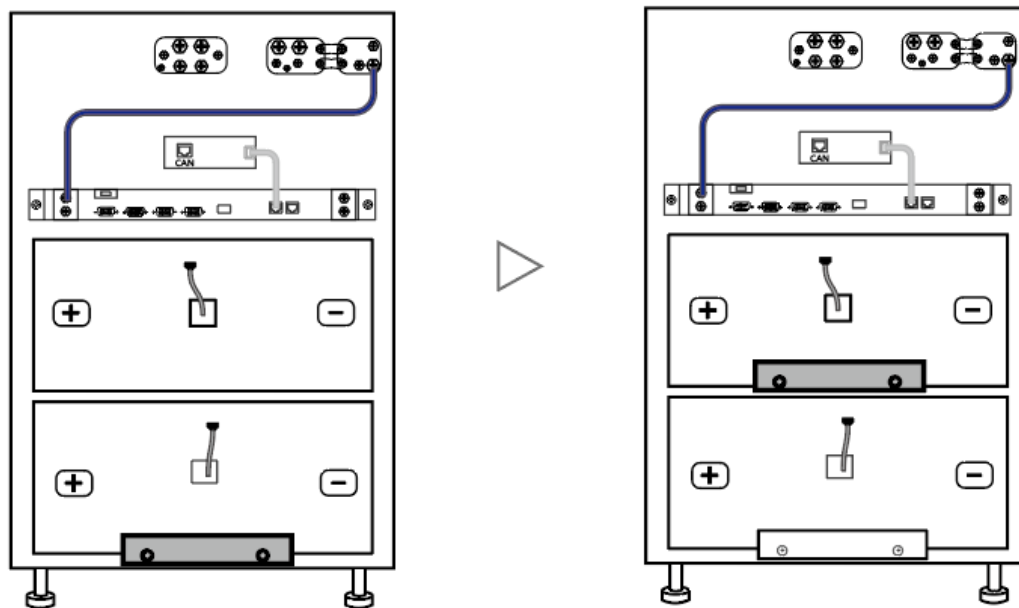
- ✓ Each layer can only install one battery module. Installers should install the batteries from the bottom layer to the top layer.
- ✓ Installers should keep the labels side facing upwards.

Disassemble the dam-board and push the battery into cabinet

Battery-Box Pro 13.8 installation guidance



Assemble the dam-board on cabinet:



5.5.5 Connecting cables

Then connect cables refer to below figure.



- ✓ The battery can only in series connection.
- ✓ Do not short connect, reverse polarity connect, and always take care of insulation.

a) Sampling cable connection

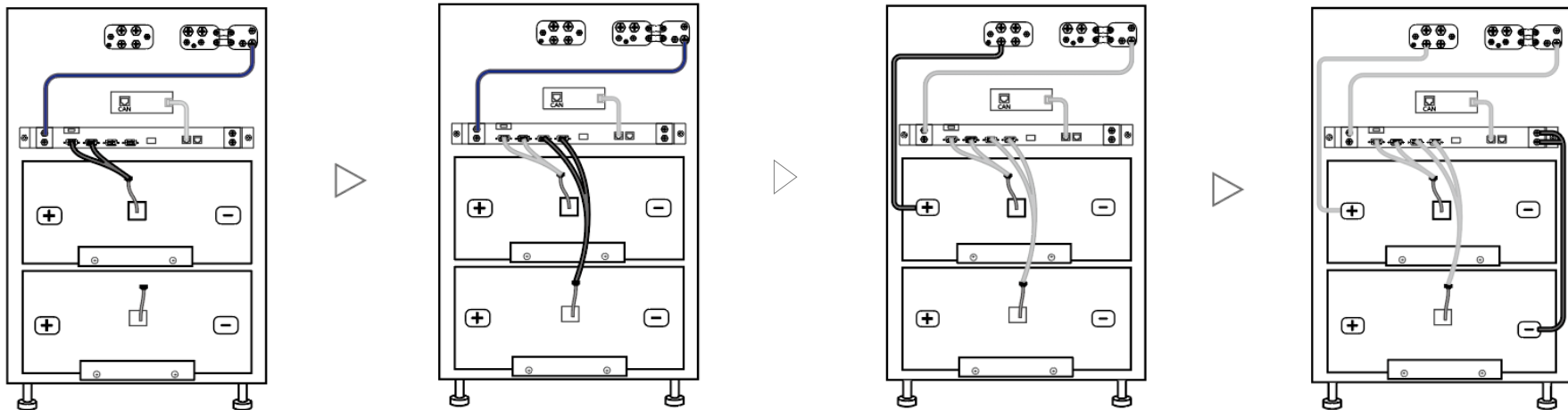
Connect the sampling cable terminal of each battery and BMS

Note: Check the sampling terminals are firmly installed.

b) BMS B+ connection

Operator only needs to connect the positive cable lead from P+ DC BUS to “B+” terminal on BMS.

Tools: Flat tip screwdriver, Fixed torque: 2.5±0.5kgf.cm

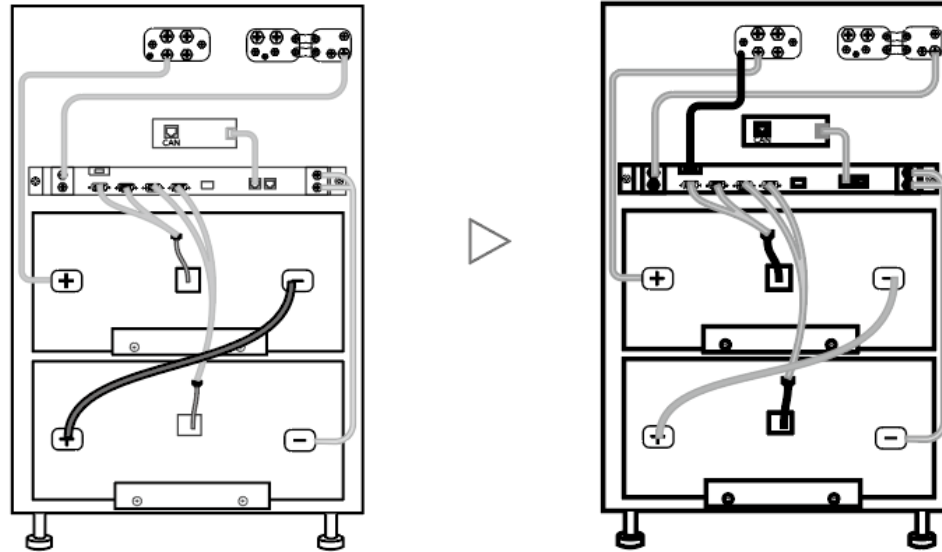


c) Connect the negative cable (Black cable from cabinet) to the “P-” of battery.

Tools: Cross screwdriver, fixed torque: 20±2kgf.cm

d) Connect the positive cable (Red cable from cabinet) to the “P+” of battery.

Tools: Cross screwdriver, fixed torque: 20±2kgf.cm



5.6 Connecting inverter

5.6.1 Communication cable connection drawing

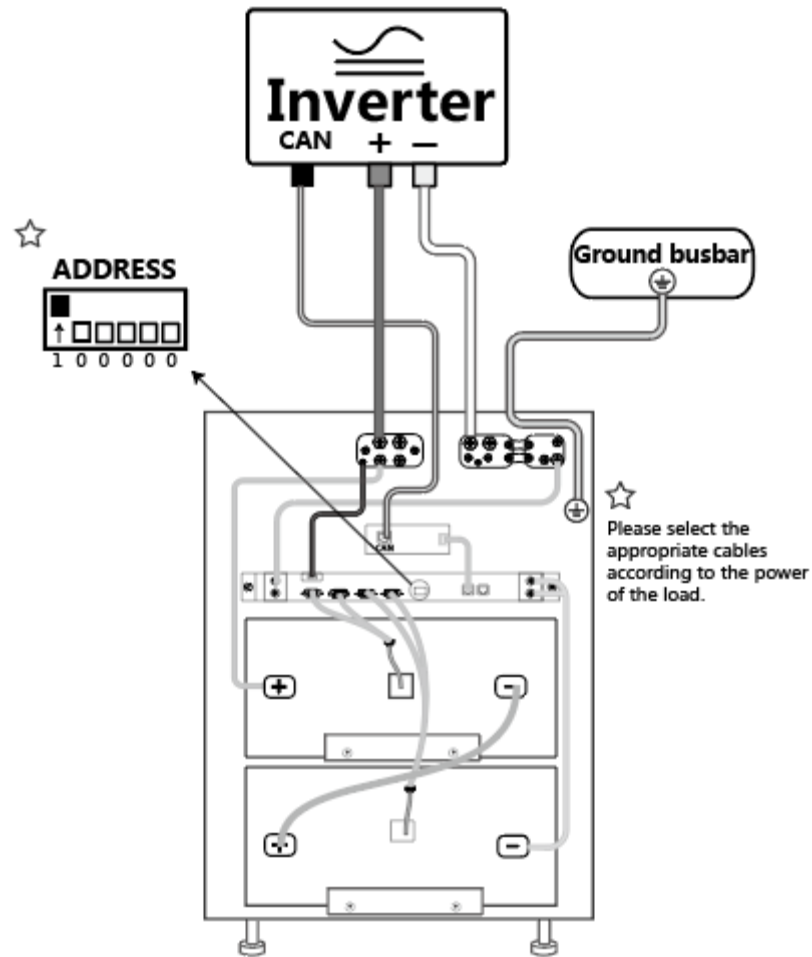
RJ45 PIN define

	Battery-Box	SMA	GOODWE	Victron	Selectronic	Sungrow
CAN H	4	4	4	7	1	5
CAN L	5	5	5	8	2	4

For detailed information on CAN connection, please consult the address list in Appendix 1. And for detailed configurations with different inverter types, please consult Appendix 4.

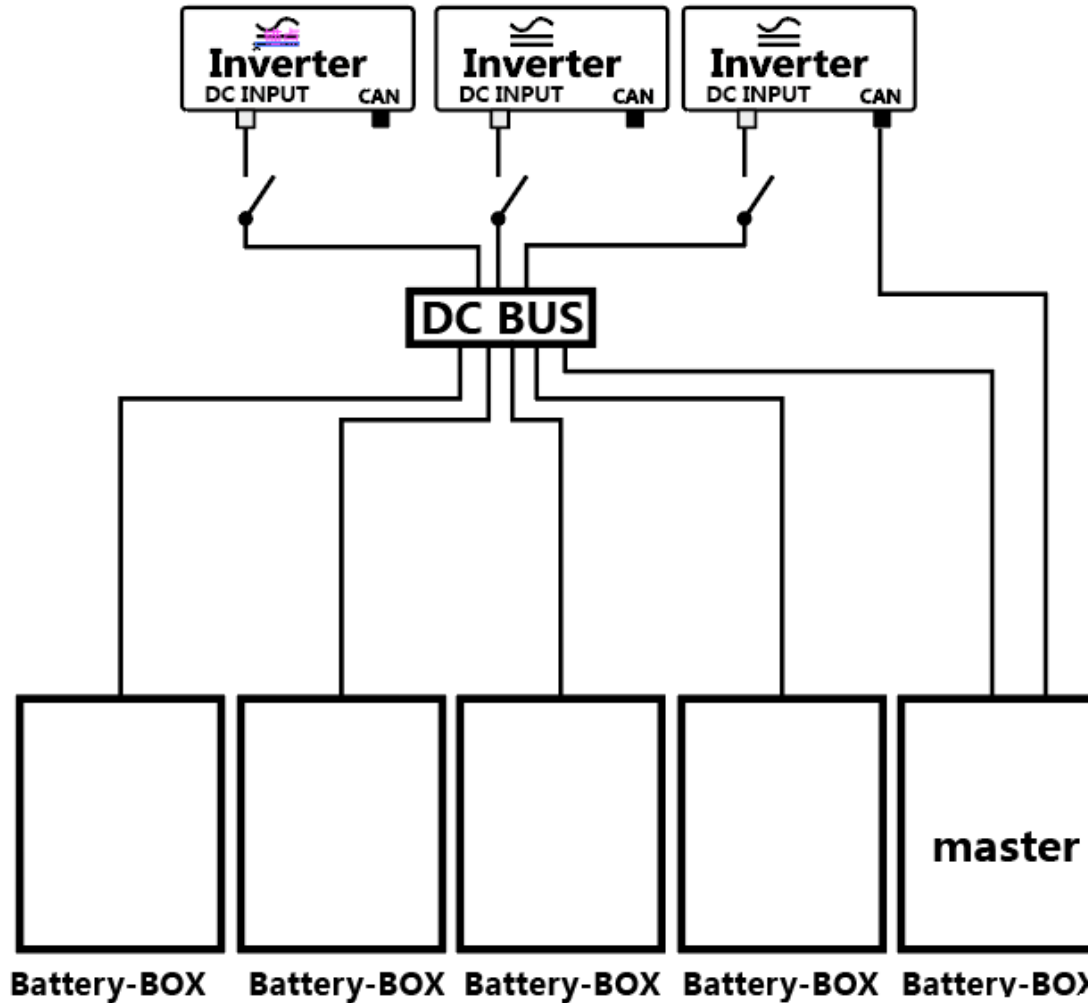
5.6.2 Connect inverter cable

Note: Connect ground cable, set address as 1



5.6.3 Additional cabinets installation

Please add a switch between inverter and battery systems, close the switch after you have turned on the battery. Because there is big capacitance in the inverter, one battery may be not be able to start it and some circuit protection will happen. To some degree, switch may help to avoid this problem. If there are a lot of inverters and battery-Box to install please follow the minimum configuration list.



When users need more than one cabinet to install, should repeat above operating steps. Then establish parallel connections between cabinets.

We can install and connect cables for all cabinets as we do for one cabinet.

Note: Each rack's negative cable needs to use the belt, and cables between each cabinet and inverter should have the same length. Be careful not to reverse connection.

5.6.4 BMS address set up

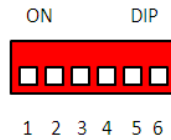
After installation, installer should setup BMS address through “ADDR” switch.

“ADDR” switch introduction:

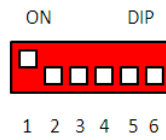
Function: For communicate between battery and BMU, BMU will communicate with external equipment when using CAN communication.

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”.

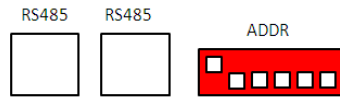


Address: 000000

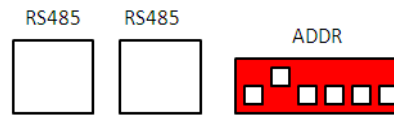


Address: 100000

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



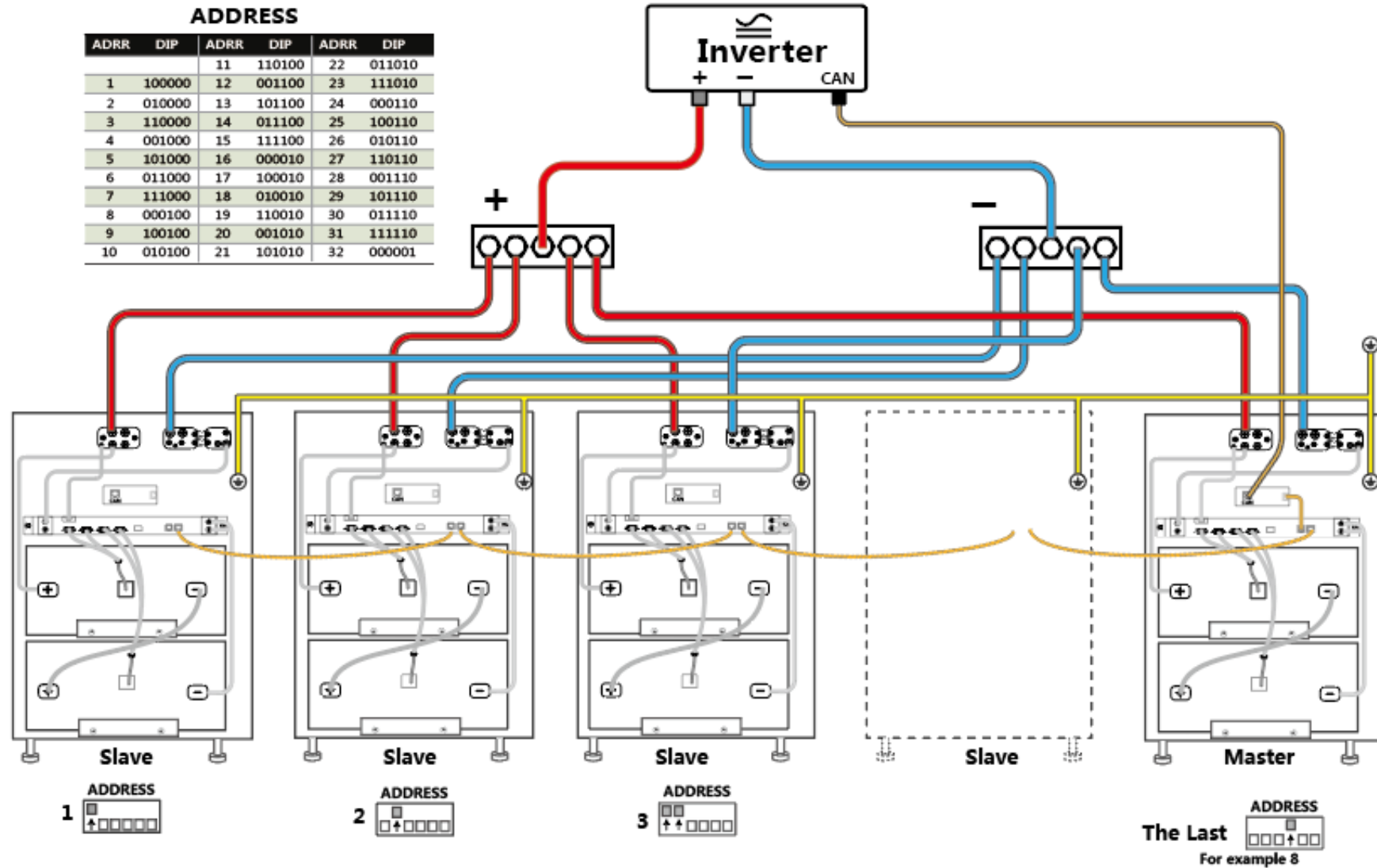
No.1 battery address: 100000



No.2 battery address: 010000

For more information on address setting, please consult the configuration list in Appendix1.

Note: Make sure that the highest address of BMS connects to BMU communicating with inverter and there is only the highest one connected to the inverter.



★ The address of the BMS must start with 1, must be consecutive, can not have 0.
 ★ Only the BMU with the last address is connected to the inverter.

6 Using Methods

Using methods: read the user manual in detail.

Notice: Before activating the system, please make sure the follows

- ✓ 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.

7 Stopping the system

Notice:

1. Before stopping the system, power off the system according to the following order :
AC Load=>PV=>Inverter=>Battery
2. After stopping the system, please check below items:
Confirm all the batteries are powered OFF.
All the LEDs are OFF.
Inverter has powered off.

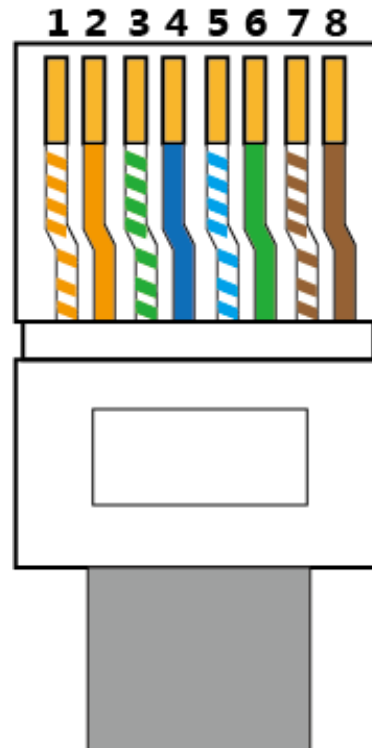
Appendix 1

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

RJ45 PIN define when connected to inverter of different types

	Battery-Box	SMA	GOODWE	Victron	Selectronic	Sungrow	Imeon
CAN H	4	4	4	7	1	5	1
CAN L	5	5	5	8	2	4	2



Note: When installers attempt “CAN” ports connections between Battery-Box and inverter, please refer to this drawing.

Appendix 2

Notice: Before activating the system, operators should check the cable connection strictly till make sure of the cable connection is tight, and check the batteries address had been setup correctly.

List of matched inverter vendors

Serial number	name
1	SMA
2	GOODWE
3	Victron
4	Selectronic
5	Sungrow
6	Imeon

1 System activating procedures when Battery-Box connects to SMA Sunny Island

(1)Start Battery-Box;

Press the “Reset (ON/OFF)” button on front panel of BMS;

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

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

Once started, the LED lights of BMS will be in different status according 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 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)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 this means the inverter is on standby.

(3)Starting 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 Appendix1.

Remark: If the battery capacity is more than or equal to 270AH, according to the Box13.8 parameter settings

(5)System is running.

2 System activating procedures when Battery-Box connects to GOODWE inverter

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

(2)Start Battery-Box;

Press the “Reset (ON/OFF)” button on front panel of BMS;

Tips: Press one second will start the battery;

Once started, the LED lights of BMS will be in different status 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)

(3)Go to the home page of APP, enter into the Battery Setting page, select “BYD Battery-Box 13.8” battery, then select “NEXT” until the last page, at last select “Start”.

Remark: If the installed capacity is more than or equal to 13.8KWh, choose "BYD Battery-Box 13.8" as the product model on the App

(4)System is running.

3 System activity procedures when Battery-Box connect 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 Battery-Box;

Press the “Reset (ON/OFF)” button on front panel of BMS;

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

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

Once started, the LED lights of BMS will be in different status 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 flash in order 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.

Appendix 3

1. Normal alarm and solution display on SMA sunny island SRC

Battery-Box Pro 13.8 installation guidance

SMA SRC	Reason	Solution
F221	External Alarm-Invalid Bat Type	1. Reset battery type to "Li" on SRC.
F920(XA01General)	1.All the batteries have failed to communicate at the same time; 2.BMU and battery are failed to RS485communicate;	1.Inspect whether the RS485 communicate cable had been connected correctly and reliably; 2.Inspect DIP switch setting according to the DIP switch setting table in user manual; 3.Change BMU in cabinet;
F930(XA11Short)	External Alarm - Short circuit	1.Power off; 2.Inspect short connection of cable between P+&P-; 3.If short connection is confirmed, please reconnect cable correctly; 4.Restart battery;
F952	External Alarm –Ext BMS Timeout	1. Check the CAN communication is connected properly. 2. Change BMU.
W936(XW01General)	External Warning - General	1.Inspect whether the RS485 communicate cable had been connected correctly and safely; 2.Inspect DIP switch setting according to the Address setting table;
W937(XW02DcHiVolt)	External Warning - Battery High Voltage	Normal alarm and no further action required;
W938(XW03DcLoVolt)	External Warning - Battery Low Voltage	Normal alarm and no further action required;

Battery-Box Pro 13.8 installation guidance

W939(XW04DcHiTmp)	External Warning - Battery High Temp	Normal alarm and no further action required;
W940(XW05DcLoTmp)	External Warning - Battery Low Temp	Normal alarm and no further action required;
W941(XW06DcHiTmpC)	External Warning - Battery High Temp Charge	Normal alarm and no further action required;
W942(XW07DcLoTmpC)	External Warning - Battery Low Temp Charge	Normal alarm and no further action required;
W943(XW08DcHiCur)	External Warning - Battery High Current	Normal alarm and no further action required;
W944(XW09DcHiChgCur)	External Warning - Battery High Current Charge	Normal alarm and no further action required;
W953	External Warning – Ext BMS Timeout	1. Check the CAN communication is connected properly. 2. Change BMU.

2. Normal alarm and solution display on BMS

	B-Plus display info	Reason	Solution
LED	Yellow LED(Alarm) blinks for 0.5Hz, other LEDs are on off continuously;	Battery power off abnormal;	1.Press "RESET(ON/OFF)" button for 2-3 secs until battery can work normal; 2.If yellow blink continuously, battery needs replacing;
	Yellow LED (Alarm), Yellow LED on and buzzing with 4 times.	Protected or external connection incorrect;	1. Power off the battery; 2.Inspect short/reverse connection of cable between P+&P-; 3.If short/reverse connection is confirmed, please reconnect cable correctly; 4.Restart battery;
Buzzer	Buzzing for 4 times	Short/reverse connection;	1.Power off; 2.Inspect short/reverse connection of cable between P+&P-; 3.If short/reverse connection is confirmed, please reconnect cable correctly; 4.Restart battery;

Appendix 4

1 Minimum configuration with SMA Sunny Island inverter

Inverter Firmware version: minimum required firmware version for SI is V1.73.

Battery-Box firmware version: minimum required firmware version for BMU is V2.7.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
SI 3.0M	≥1
SI 4.4M	≥1
SI 6.0H	≥1
SI 8.0H	≥1
3 Phase on Grid	
Inverter Type	Battery-Box 13.8
SI 3.0M	≥1
SI 4.4M	≥1
SI 6.0H	≥1
SI 8.0H	≥1
1 Phase off Grid	
Inverter Type	Battery-Box 13.8
SI 3.0M	≥1
SI 4.4M	≥1
SI 6.0H	≥1
SI 8.0H	≥1
3 Phase off Grid	
Inverter Type	Battery-Box 13.8
SI 3.0M	≥2
SI 4.4M	≥2
SI 6.0H	≥3

SI 8.0H	≥3
Remark: Maximum quantity of Battery-Box13.8 is 32.	

2 Minimum configuration with GOODWE inverter

2.1 Minimum configuration with ES

Inverter Firmware version: minimum required firmware version for ARM is 03.

Battery-Box firmware version: minimum required firmware version for BMU is V4-10.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
GW3648D-ES	≥1 ¹
GW5048D-ES	≥1 ¹
1 Phase off Grid	
Inverter Type	Battery-Box 13.8
GW3648D-ES	≥1
GW5048D-ES	≥1
Remark: Maximum quantity of Battery-Box13.8 is 32.	

2.2 Minimum configuration with BP

Inverter Firmware version: minimum required firmware version for ARM is 03.

Battery-Box firmware version: minimum required firmware version for BMU is V4-10.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
GW2500-BP	≥1
Remark: Maximum quantity of Battery-Box13.8 is 32.	

¹ This configuration is only for self-consumption application

2.3 Minimum configuration with EM

Inverter Firmware version: minimum required firmware version for ARM is 03.

Battery-Box firmware version: minimum required firmware version for BMU is V4-10.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
GW3048-EM	≥1 ¹
GW3648-EM	≥1 ¹
GW5048-EM	≥1 ¹
1 Phase off Grid	
Inverter Type	Battery-Box 13.8
GW3048-EM	≥1
GW3648-EM	≥1
GW5048-EM	≥1
Remark: Maximum quantity of Battery-Box13.8 is 32.	

2.4 Minimum configuration with SBP

Inverter Firmware version: minimum required firmware version for ARM is 03.

Battery-Box firmware version: minimum required firmware version for BMU is V4-10.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
GW3600S-BP	≥1
GW5000S-BP	≥1
Back-up mode	
Inverter Type	Battery-Box 13.8
GW3600S-BP	≥1
GW5000S-BP	≥1
Remark: Maximum quantity of Battery-Box13.8 is 32.	

3 Minimum configuration with Victron inverter

3.1 Minimum configuration with Multiplus

Inverter Firmware version: minimum required firmware version for CCGX is V2.01.

Battery-Box firmware version: minimum required firmware version for BMU is V4-17.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥1
48/5000/70	≥1
3 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥1
48/5000/70	≥1
1 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥1
48/5000/70	≥1
3 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥2
48/5000/70	≥3
Remark: Maximum quantity of Battery-Box13.8 is 32.	

3.2 Minimum configuration with Multigrid

Inverter Firmware version: minimum required firmware version for CCGX is V2.01

Battery-Box firmware version: minimum required firmware version for BMU is V4-17.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥1
3 Phase on Grid	
Inverter Type	Battery-Box 13.8

48/3000/35	≥1
1 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥1
3 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/3000/35	≥2
Remark: Maximum quantity of Battery-Box13.8 is 32.	

3.3 Minimum configuration with Quattro

Inverter Firmware version: minimum required firmware version for CCGX is V2.01.

Battery-Box firmware version: minimum required firmware version for BMU is V4-17.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/5000/70-100/100	≥1
48/8000/110-100/100	≥1
48/10000/140- 100/100	≥1
48/15000/200- 100/100	≥1
3 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/5000/70-100/100	≥1
48/8000/110-100/100	≥2
48/10000/140- 100/100	≥2
48/15000/200- 100/100	≥3
1 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/5000/70-100/100	≥1
48/8000/110-100/100	≥2
48/10000/140- 100/100	≥2
48/15000/200- 100/100	≥3

3 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/5000/70-100/100	≥3
48/8000/110-100/100	≥5
48/10000/140- 100/100	≥6
48/15000/200- 100/100	≥7

Remark: Maximum quantity of Battery-Box13.8 is 32.

3.4 Minimum configuration with Easysolar with CCGX

Inverter Firmware version: minimum required firmware version for CCGX is V2.01.

Battery-Box firmware version: minimum required firmware version for BMU is V4-17.

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/3000/35-50 MPPT150/70	≥1
48/5000/70-100 MPPT150/100	≥1

3 Phase on Grid	
Inverter Type	Battery-Box 13.8
48/3000/35-50 MPPT150/70	≥1
48/5000/70-100 MPPT150/100	≥1

1 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/3000/35-50 MPPT150/70	≥1
48/5000/70-100 MPPT150/100	≥1

3 Phase off Grid	
Inverter Type	Battery-Box 13.8
48/3000/35-50 MPPT150/70	≥2
48/5000/70-100 MPPT150/100	≥3

Remark: Maximum quantity of Battery-Box13.8 is 32.

4 Minimum configuration with Sungrow

4.1 Minimum configuration with SH5K

Inverter Firmware version: minimum required firmware version is V13.

Battery-Box firmware version: minimum required firmware version for BMU is V4-10, identification label on package: V2.2

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
SH5K	≥1
1 Phase off Grid ^{3&1}	
Inverter Type	Battery-Box 13.8
SH5K	≥1
Remark: Maximum quantity of Battery-Box13.8 is 8.	

5 Minimum configuration with Selectronic

5.1 Minimum configuration with SP PRO

Inverter Firmware version: minimum required firmware version is V0.27.

Battery-Box firmware version: minimum required firmware version for BMU is V4-10, identification label on package: V2.2

1 Phase on Grid	
Inverter Type	Battery-Box 13.8
SPMC481-AU	≥1
SPMC482-AU	≥1
1 Phase off Grid ^{3&1}	
Inverter Type	Battery-Box 13.8
SPMC481-AU	≥1
SPMC482-AU	≥2
Remark: Maximum quantity of Battery-Box13.8 is 8.	

Appendix 4

1 SMA charger min capacity:

Parameter setup for Battery-Box13.8**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	270
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	270
261.01SifCsmplncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4
262.03BuresSOC	0
262.04PVResSOC	4
262.05MinSifCsmplSOC	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	270
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	4
262.04PVResSOC	4
262.03BuresSOC	0
262.05MinSlfCsmpSOC	85

Parameter setup for Battery-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 Battery-Box13.8

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	270
262.01ProtResSOC	3
262.02BatResSOC	9

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	270
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.03BuresSOC	0
262.04PVResSOC	6
262.05MinSlfCsmpSOC	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	270
261.01SlfCsmpIncEna	Enable
261.03Saisonenable	Yes
262.01ProtResSOC	3
262.02BatResSOC	6
262.04PVResSOC	6
262.03BuresSOC	0
262.05MinSlfCsmpSOC	80

2 Goodwe charger min capacity

Product	Min capacity
Battery-Box 2.5	20%
Battery-Box 5.0	15%
Battery-Box 7.5	15%
Battery-Box 10.0	15%
Battery-Box 13.8	15%

Note: Min capacity means a reserved SOC for the safety of battery, and it is consistent with DOD showed in some inverter brands. It applies in both on-grid or off-grid mode.

3 Imeon charger min capacity

Product	Min capacity(On-grid)
Battery-Box 13.8	10%

Product	Min capacity(Off-grid)
Battery-Box 13.8	10%