SUN SYNK®

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SUN SYNK®

SUN-BATT-80
Product Description

CONTENTS

01

TECHNICAL DATA

[Overview]

Indoor battery rack with IP20 protection level, inbuild lithium-ion battery and BMS

[Easy Installation and Maintenance]

Local and remote management, standard rack&module design, front maintenance

[Safe & Reliable]

Self-developed 2-level / 3-level BMS, complex protection, safe and reliable

[High Density]

LP high-capacity Li-ion battery with aluminum shell, over 130wh/kg

[Long Lifespan]

Long cycle life, 6000 cycles *

[Cell Balancing Technology]

Active cell balancing and passive cell balancing

DATASHEET

Model	SUN-BATT-80
Performance	
Battery module (Wh/V)	6.144 kWh，51.2V，64kg（141lbs)
Number of modules	13
Cell technology	LFP (LiFePO4)
Battery usable energy [1]	79.82 kWh
Nominal voltage	665.6 V
Operating voltage	592.8 V~730.08 V
Nominal output current	48 A / 84 A
Communication	
Display	SOC status indicator, LED indicator
Communication	CAN / RS485 / RS232
General Specification	
Dimension (W*D*H)	2420x305x1150 mm
	95.3x12x45.3 inch
Weight	About 886kg (1953lbs)
Operating temperature [2]	-20 to 60 ℃ (-4 to 140 ℉)
Environmental humidity	≤ 95%RH (No condensation)
Protection rating	IP 20
Cycle life [3]	6000 Cycles @ 80% DOD / 25℃ / 0.5C，60% EOL
Scalability	Yes
Application	ON Grid / ON Grid + Backup / OFF grid
Compatible PCS	Refer to compatible PCS list
Standard Compliance	
Certificates	Cell: UN38.3 / IEC62619 / UL 1642 / JET
	Pack: UN38.3 / IEC62619 / IEC61000
	Available upon request
Ordering and Deliverable Part	
Part	SUN-BATT-6.1P-OT (Battery module)
	SUN-BATT-BCU-080H1-OT (Main control box)
	SUN-BATT-6.1BP (Battery pedestal)

[1] Test conditions: 100% depth of discharge (DoD), 0.2C rate charge & discharge at 25℃
[2] Charge/discharge derating occurs when the operating temperature from -10℃ to 5 ℃& 45 ℃ to 55 ℃
[3] Please refer to the Warranty Letter for applicable conditions

02

PRODUCT OVERVIEW

2.1 Brief Introduction

Product overview

SUN-BATT-80 is a high-voltage lithium battery consisting of 13 pcs battery modules (51.2V/120AH) and one BCU (Battery Control Unit) in series with an operating voltage range between 582.4V-730.1V. It is designed for commercial / industrial energy storage applications and works together with a high battery voltage hybrid inverter. SUN-BATT-80 is not suitable for supporting life-sustaining medical devices.

SUN-BATT-80 has built-in BMS (Battery Management System, including master BMS in BCU and slave BMS in battery modules), which can manage and monitor cells information including voltage, current, and temperature. Besides that, BMS can balance cells charging to extend cycle life. BMS has protection functions including over-discharge, over-charge, over-current, and high temperature; the system can automatically manage charge state, discharge state and balance state.

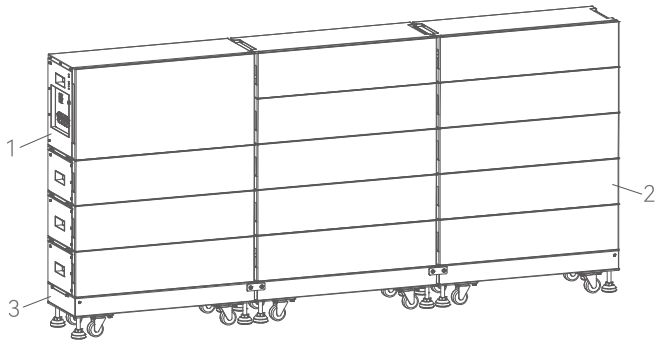
SUN-BATT-80 has an internal soft-start circuit, so SUN-BATT-80 can support the inverter without asoft-start function. Multiple SUN-BATT-80 can be connected in parallel to expand capacity and power. The 8 SUN-BATT-80 can be connected in parallel at most, for example, connect 8 x SUN-BATT-80 in parallel to get a 640kWh battery system.

SUN-BATT-80 supports independent charging. When multiple SUN-BATT-80 are connected in parallel, after one SUN-BATT-80 is fully charged, the inverter can keep charging other SUN-BATT-80 until all SUN-BATT-80 are fully charged.

SUN-BATT-80 supports black start function while working with compatible inverters.

2.2 Battery System Overview

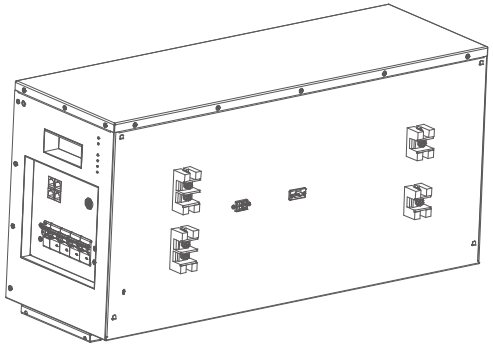
SUN-BATT-80 consists of base, battery modules connected in series and BCU (Battery Control Unit).



NO.	Description
1	BCU (Battery Control Unit)
2	Battery Module
3	Base

2.3 BCU

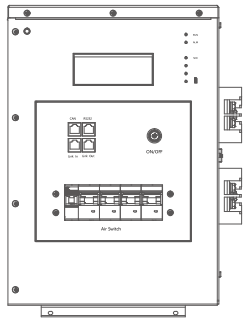
BCU includes master BMS, Breaker, DC fuse, Soft-start circuit, Charge circuit, Discharge circuit, parallel independent charge control circuit and 12V DC/DC power supply module.
Master BMS controls charge voltage/current and discharge voltage/current according to the cell voltage and temperature provided by slave BMS in battery modules. Master BMS communicates with PCS through CAN communication.



2.31 Technical Data

Parameters	Specification
Operating Voltage	592.8 V–730.08 V
Nominal Current	48 A / 84 A
Maximum Current	84 A
Working Temperature	-20℃~60℃
Environmental Humidity	≤95%RH
Protection Class	IP20
Cooling	Natural
Weight(kg)	24 kg
Dimension(W*H*D)	800*305*384 mm
Communication	CAN / RS232
Certificates	IEC62619、IEC62040-1

2.32 LED Indicator Definition



Note:
Flash 1 – 0.25s Light / 3.75s Off
Flash 2 – 0.5s Light / 0.5s Off
Flash 3 – 0.5s Light / 1.5s Off

LED Indicators Instructions

Status		L6	L5	L4	L3	L2	L1	Descriptions
Shut down		OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby		Flash 1	OFF	According to the battery level				Indicates Standby
Charging	Normal	Light	OFF	According to the battery level				The highest capacity indicator LED flashes(flash 2),others lighting
	Full Charged	Light	OFF	Light	Light	Light	Light	Turn to standby status when charger off
	Protection	OFF	Light	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	Flash 3	OFF					
	UVP	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
	Protection	OFF	Light	OFF	OFF	OFF	OFF	Stop discharge
Fault		OFF	Light	OFF	OFF	OFF	OFF	Stop charging and discharge

Charging Battery Level Indicators Instructions

Status		Charging					
Battery Level Indicator		L6	L5	L4	L3	L2	L1
Battery Level (%)	0 ~ 25%	Light	OFF	OFF	OFF	OFF	Flash 2
	26 ~ 50%			OFF	OFF	Flash 2	Light
	51 ~ 75%			OFF	Flash 2	Light	Light
	76 ~ 100%			Flash 2	Light	Light	Light
	Full Charged			Light	Light	Light	Light

Discharging Battery Level Indicators Instructions

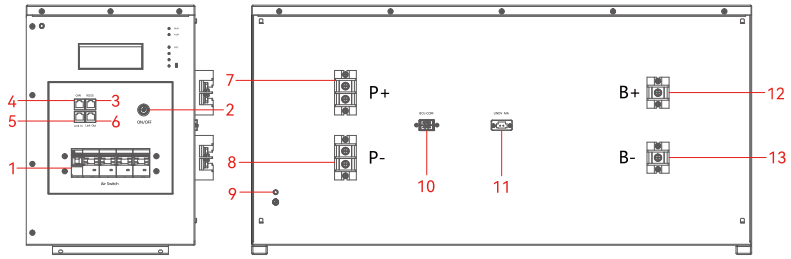
Status		Discharge					
Battery Level Indicator		L6	L5	L4	L3	L2	L1
Battery Level (%)	0 ~ 25%	Light	OFF	OFF	OFF	OFF	Light
	26 ~ 50%			OFF	OFF	Light	Light
	51 ~ 75%			OFF	Light	Light	Light
	76 ~ 100%			Light	Light	Light	Light

High voltage power indicator

Status LEDs:	L1	L2	L3	L4	L5	L6	Protect against fault states
1	OFF	OFF	OFF	OFF	Light	OFF/Light	Cell failure
2	OFF	OFF	OFF	Light	Light	OFF/Light	NTC fai lure
3	OFF	OFF	Light	OFF	Light	OFF/Light	Precharge fai lure
4	OFF	OFF	Light	Light	Light	OFF/Light	Short circuit fai lure
5	OFF	Light	OFF	OFF	Light	OFF/Light	Faulty charging contactor
6	OFF	Light	OFF	Light	Light	OFF/Light	Di scharge contactor fai lure
7	OFF	Light	Li ght	OFF	Li ght	OFF/Light	Pre-charge contactor fai lure
8	OFF	Light	Light	Light	Light	OFF/Light	Total negative contact failure
9	Light	OFF	OFF	OFF	Light	OFF/Light	Overvol tage protection of charging cells
10	Light	OFF	OFF	Li ght	Li ght	OFF/Light	Overa1l charging overvol tage protection
11	Light	OFF	Li ght	OFF	Light	OFF/Light	Charging overcurrent protection
12	Light	OFF	Light	Light	Light	OFF/Light	Di scharge cell undervoltage protection
13	Li ght	Light	OFF	OFF	Light	OFF/Light	Di scharge overal 1 undervol tage protection
14	Li ght	Light	OFF	Light	Light	OFF/Light	Di scharge overcurrent protection
15	Light	Li ght	Light	OFF	Light	OFF/Light	Charging high temperature and low temperature protection
16	Light	Light	Light	Light	Light	OFF/Light	High temperature and low t emperature protection of di scharge

Note:
1. The fault lamp ALM is not on in a normal state, at this time the SOC lamp is used as a power indication, and the fault lamp ALM is always on when the fault occurs, the SOC lamp is on according to the fault sequence number (priority sequence number from low light), if a variety of protection faults exist, the RUN lamp also needs to be on constantly;

2.33 Port Definition



NO.	Items	NO.	Items
1	Power Switch	8	P-
2	ON/OFF Button	9	GND
3	RS232 Port	10	BCU-COM
4	CAN Port	11	UNDV MA
5	BCU Link Port In	12	B+
6	BCU Link Port Out	13	B-
7	P+		

2.331 Power Switch

Main MCB: Switch ON/OFF SUN-BATT-80.

2.332 ON/OFF Button

After switch ON the Power Switch, long press ON/OFF button to switch ON/OFF SUN-BATT-80.

2.333 BCU Link Port / CAN Port

BCU Link Port In / Link Port Out / CAN port communication follows CAN protocol, for communication between batteries and PCS.

2.334 RS232 Port

RS232 Communication Terminal (RJ45 port) follows RS232 protocol, for the manufacturer or professional engineer to debug or service.

PIN	Definition
Pin 1、PIN 8	GND
Pin 2、PIN 7	RS232_TX
Pin 3、PIN 6	RS232_ RX

2.4 Battery Module

Battery module includes 51.2V/120AH battery unit and slave BMS. The slave BMS collects the cell voltage and temperature of the battery unit in real time and sends these messages to the master BMS through internal communication.

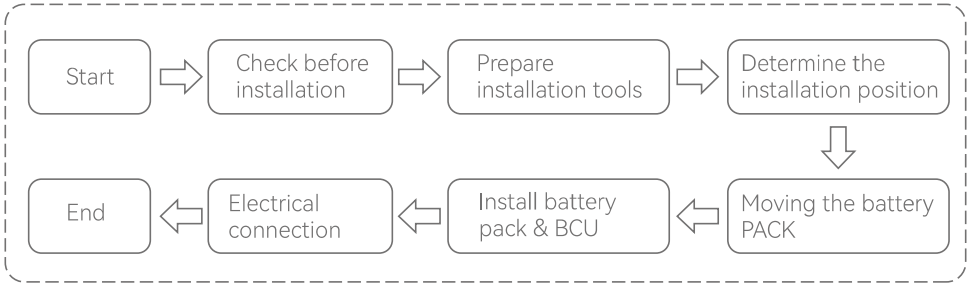
Slave BMS integrates a cell balance circuit, which can balance cell capacity according to the control instructions of Master BMS.

Parameters	Specification
Battery Type	LiFePO4，Lithium Iron Phosphate
Nominal Voltage	51.2 V
Nominal Capacity	120 Ah
Nominal Energy (100%DOD)	6.144 KWh
Usable Energy (90%DOD)	5.529 KWh
DOD	< 90%
Nominal Charging Current	48 A / 84 A
Maximum Charging Current	84 A
Nominal Discharge Current	48 A / 84 A
Maximum Discharge Current	84 A
Working Temperature	-20℃~60℃
Environmental Humidity	≤95%RH
Protection Class	IP20
Cooling	Natural
Weight(kg)	64 kg
Dimension(W*H*D)	800*305*190 mm
Certificates	IEC62619、UN38.3、IEC62040-1
Cycle Life	6000 cycles @ 80% DOD / 25℃ / 0.5C，60%EOL

03

Installation Guide

Installation flow chart



3.1 Checking Before Installation

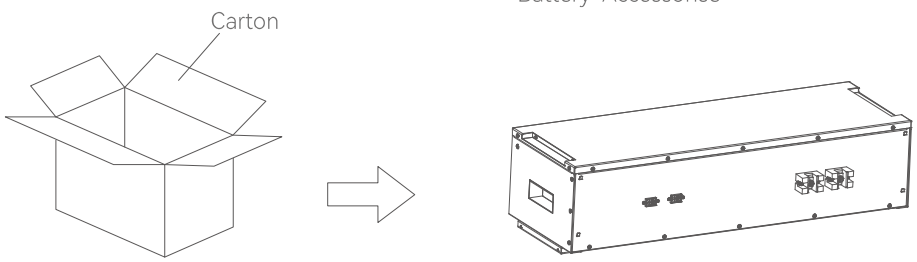
3.11 Checking Outer Packing Materials

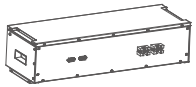
Packing materials and components may be damaged during transportation. Therefore, check the outer packing materials before installing the battery. Checking the surface of the packing material for any damage, such as holes and cracks. If any damage is found, do not unpack the battery and contact the dealer as soon as possible. Remove the packing materials within 24 hours before installing the battery.

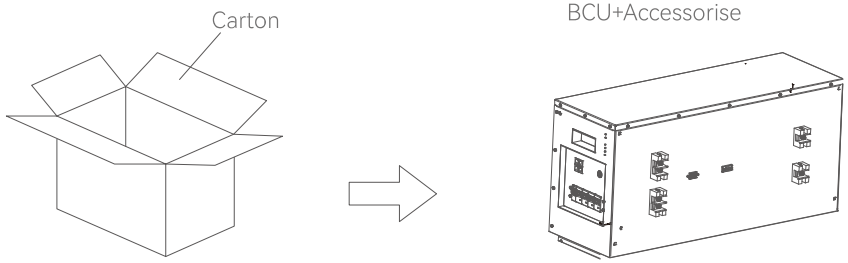
3.12 Checking Deliverables

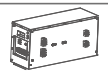
After unpacking the battery, check whether deliverables are intact and complete. If any damage is found or any component is missed, contact the dealer.

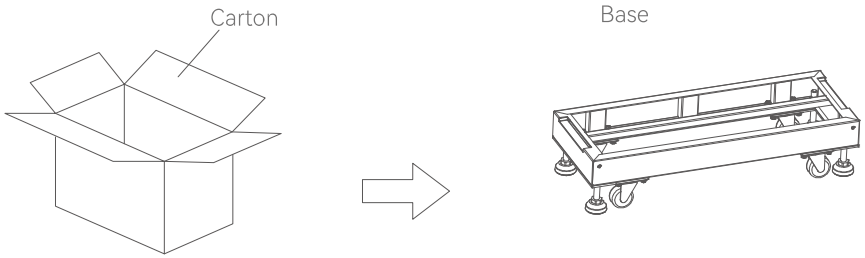
The below table shows the components that should be delivered.

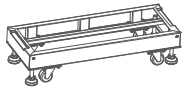


Battery			
NO.	Pictures	Quantity	Description
1		1PCS	Battery
2		1PCS	Face Cover
3		1PCS	Test Report
4		1PCS	Certificate



BCU			
NO.	Pictures	Quantity	Description
1		1PCS	BCU
2		1PCS	Face cover
3		1PCS	Fixed base fitting
4		2PCS	Wall lock fittings
5		1PCS	Communication cable 1
6		10PCS	Communication cable 2
7		2PCS	Communication cable 3
8		1PCS	Power cable 1
9		10PCS	Power cable 2
10		2PCS	Power cable 3
11		1PCS	Power cable 4
12		56PCS	M4*35
13		6PCS	M6*12
14		2PCS	M6*60 Expansion bolts
15		1PCS	Manual
16		1PCS	Test report
17		1PCS	Certificate



Base			
NO.	Pictures	Quantity	Description
1		1PCS	Base

3.2 Tools

Model	Tools		
Installation	Knife 	Hammer drill (10mm) 	Socket wrench (10mm) 
	Rubber mallet 	Cross Screwdriver 	Marker 
	Incinometer 	Measuring tape 	
Protection	ESD gloves 	Safety goggles 	Anti-dust respirator 
	Safety shoes 		

3.3 Installation Requirements

3.31 Installation Environment Requirements

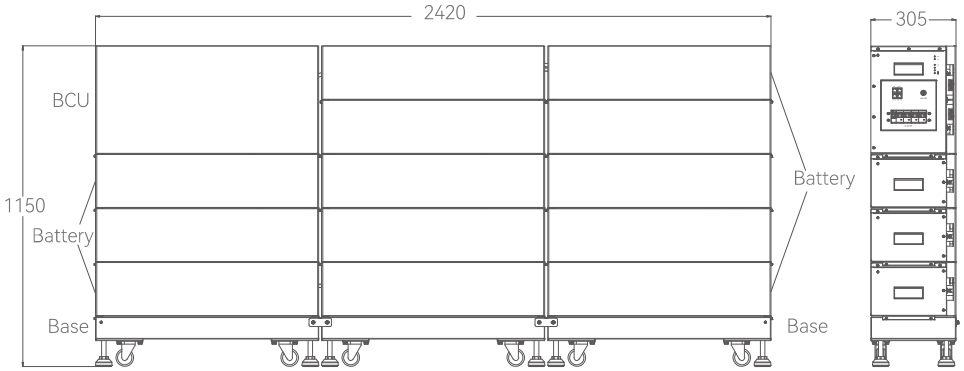
- Install the battery in the indoor environment.
- Place batteries in a secure location away from children and animals.
- Do not place the battery near any heat sources and avoid sparks.
- Do not expose the battery to moisture or liquids.
- Do not expose the battery to direct sunlight.

3.32 Installation Carrier Requirements

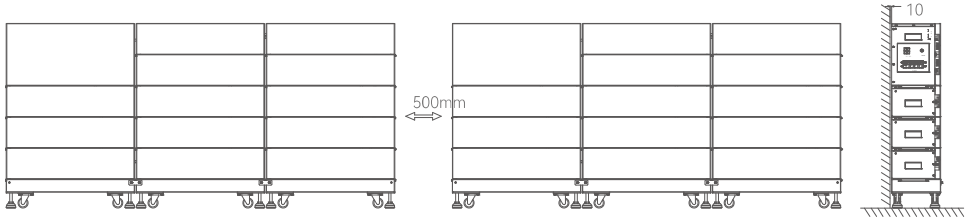
- Only mount battery on fire-resistant buildings. Do not install batteries on flammable buildings.
- Battery is quite heavy, make sure the wall/ground can meet the load-bearing requirements.

3.4 Installation Instructions

3.41 Dimensions



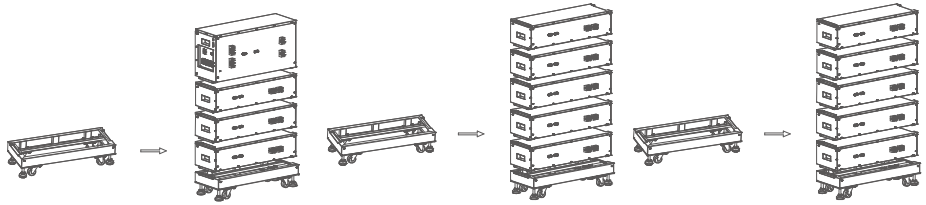
Minimum mounting interval:



3.42 Installation Steps

Step 1

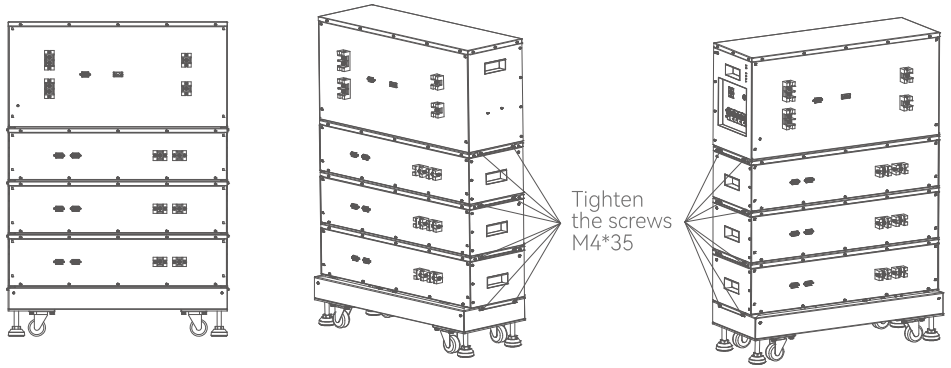
Stack the battery boxes and main control boxes on the bases according to the figure.



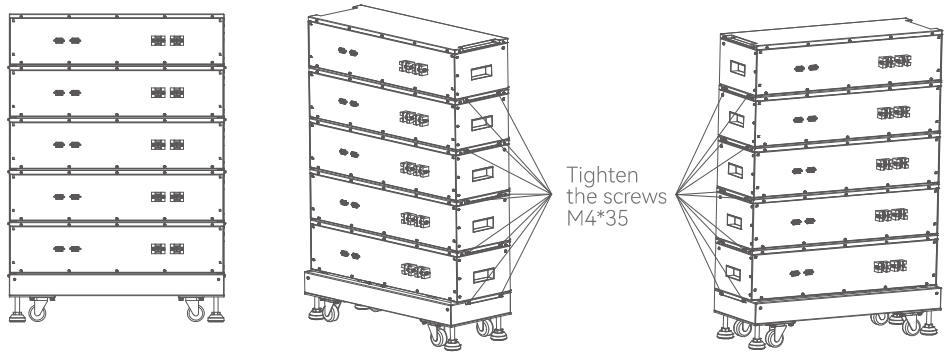
Part 1 Part 2 Part 3

Step 2

Secure the screws between the main control box, battery box, and base.



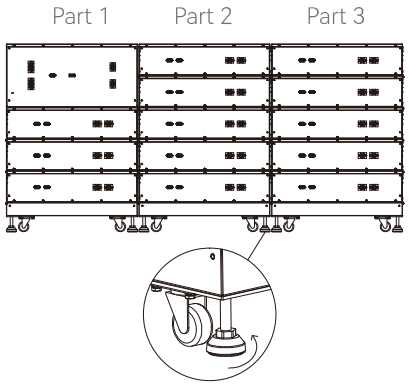
Part 1



Part 2 & Part 3

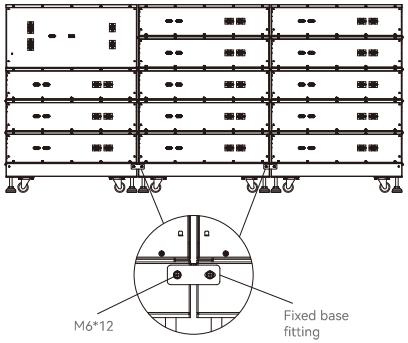
Step 3

Push the three rows of batteries together, place them according to the diagram, and hold up the foundation.



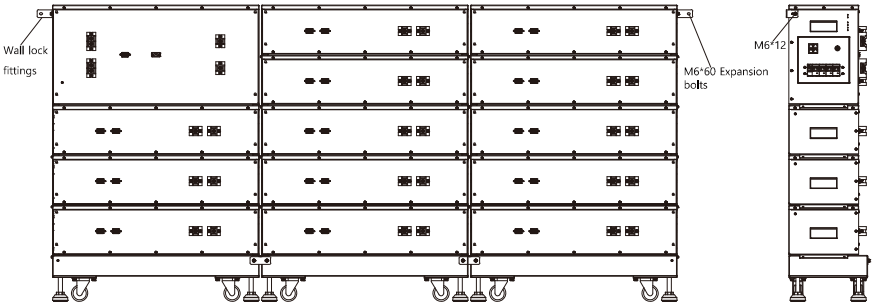
Step 4

Secure the three rows of battery lock screws.



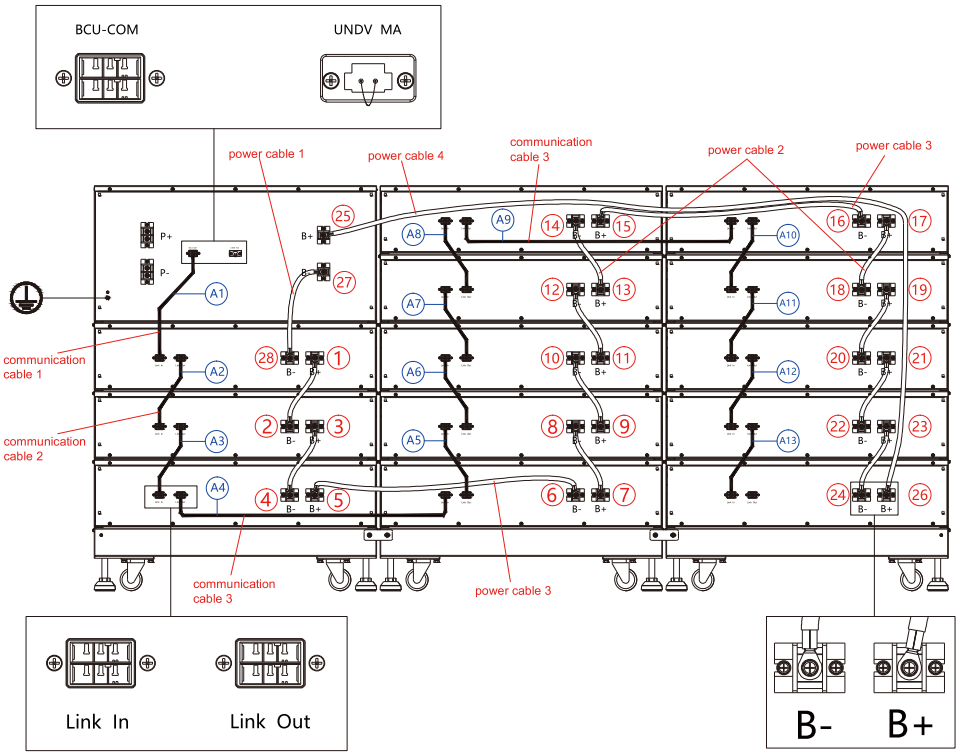
Step 5

Lock the battery against the wall.



Step 6

Battery system connection power cable, communication cable, grounding cable (as shown in the figure).



Communication cables are connected in A1 to A13 sequence

Power cable connection sequence 1 to 28

Step 7

Electrical connections.

1、Prepare power cable on side

You are advised to use the EV power cable with size 10mm² or 7AWG（1500V).

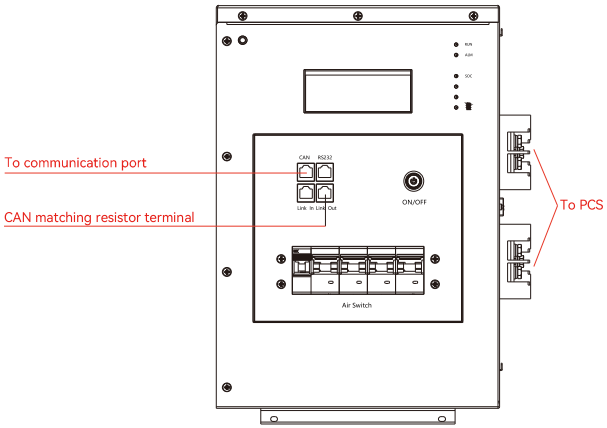
2、Prepare CAN communication cable on side

Refer to the following BCU CAN communication cable definition, according to the different inverter communication port definition, make corresponding communication terminal on site.

BCU CAN communication cable definition:

PIN	Definition
Pin 4	CAN_H
Pin 5	CAN_L

3、Single SUN-BATT-80 electrical connection



A、Connect Power cable

Connect P+\P- power cable from BCU to isolation device.

Note: Reverse connection prohibited!

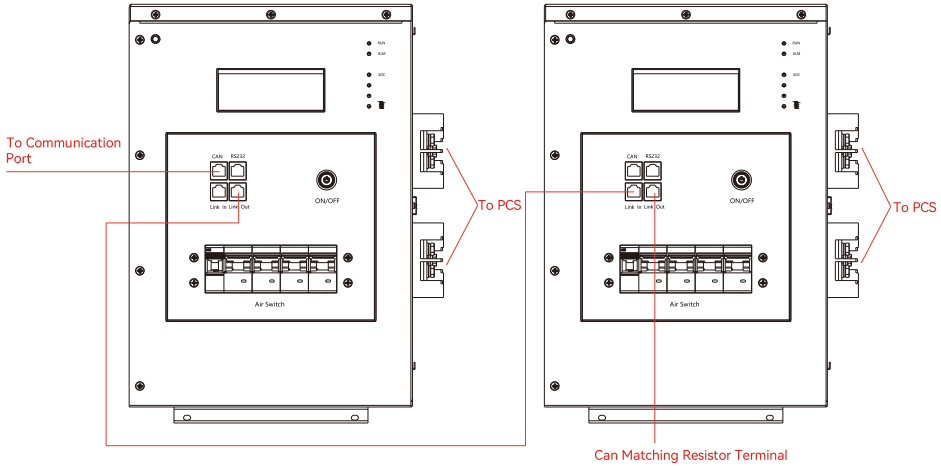
B、Connect CAN communication cable

Connect CAN cable from BCU CAN port to PCS communication port.

C、Connect CAN matching resistor terminal

Connect CAN matching resistor terminal to BCU Link Out.

4、Multiple SUN-BATT-80 parallel electrical connection



NOTE: BCU1 is BCU of 1st SUN-BATT-80; BCU2 is BCU of 2nd SUN-BATT-80, and so on.

A、Connect Power cable

Connect P+\P- power cable from BCU to isolation device.

Note: Reverse connection prohibited!

B、Connect CAN communication cable

Connect CAN cable from BCU1 CAN port to PCS communication port.

C、Connect parallel communication cable

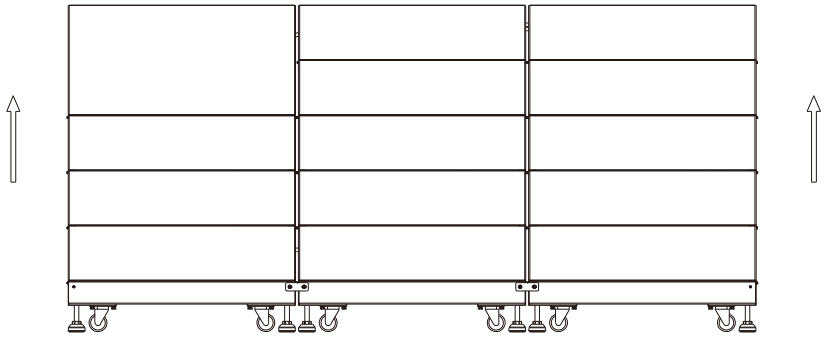
Connect parallel communication cable from BCU1 Link Out to BCU2 Link In.

D、Connect CAN matching resistor terminal

Connect CAN matching resistor terminal to BCU2 Link Out.

Step 8

Install the battery system on the front cover from the bottom up.



Step 9

NOTE: BCU1 is BCU of 1st SUN-BATT-80; BCU2 is BCU of 2nd SUN-BATT-80, and so on.

1、Single SUN-BATT-80

A、Switch ON BCU power switch;

B、Switch ON/OFF SUN-BATT-80.

1、Switch ON SUN-BATT-80: Press ON/OFF button more than 3s, LED will light from L6\L4 to L1, and then enters to automatic coding while all LED lights. After finished automatic coding, L1 to L4 shows the normal capacity, and L6 shows the running status.

2、Switch OFF SUN-BATT-80: Press ON/OFF button more than 3s, LED will light from L1 to L4\L6, then SUN-BATT-80 will switch OFF, then Switch OFF the Power Switch.

2、Multiple SUN-BATT-80 in Parallel

A、Switch ON power switch of BCU1 and BCU2;
B、Switch ON/OFF the battery system.

1、Press ON/OFF button of BCU1 more than 3s, LED will light from L6 / L4 to L1, and then enter to automatic coding(assign BCU address and battery pack address) while all LED lights. After finished automatic coding, L1 to L4 shows the normal capacity, and L6 shows the running status.
2、Switch OFF the battery system: Press ON/OFF button of BCU1 more than 3s, LED will light from L1 to L4\L6, then the battery system will switch OFF, and then switch OFF the Power Switch.

Note:

1、After switching OFF battery system with ON/OFF button (Power Switch still ON), the battery system can be activated by charging the battery.
2、The battery needs to be fully charged for SOC calibration when it's switched ON for the first time.

04

Cleaning and Maintenance

4.1 Cleaning

CAUTION:

Please power off the system before cleaning.

It is recommended that the SUN-BATT-80 should 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.

4.2 Maintenance

4.21 Battery Storage

Batteries should be stored in an environment with a temperature range between -10℃ ~ +45 ℃, and maintained regularly according to the following table with 0.4C (48A) 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℃	/	prohibit	/
-10~25℃	5%~70%	≤12 months	30%≤SOC≤60%
25~35℃	5%~70%	≤6 months	30%≤SOC≤60%
35~45℃	5%~70%	≤3 months	30%≤SOC≤60%
Above 45℃	/	prohibit	/

4.22 Recharge Requirements When Over Discharged

Please recharge the over discharged batteries (90% DOD) 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

Recharge conditions when in storage		
Storage Environment Temperature	Storage Time	Note
-10~25℃	≤15 days	Battery Pack disconnect to PCS
25~45℃	≤7 days	