



HIGH VOLTAGE SERIES LI-ION RACK MOUNT SYSTEM



USER MANUAL

HIGH VOLTAGE BATTERY - SUNSYNK-W

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IMPORTANT INFORMATION

Scope

The installation and operation manual is for the modular battery energy storage system. Please read this manual carefully for the safe installation, initial setup, and maintenance of the SUNSYNK-W. Qualified and authorised personnel should handle installation, setup, and maintenance. Keep this manual and other relevant documents near the battery energy storage system for easy access by installation or maintenance personnel.

This manual is only valid for countries that meet certification requirements. Follow local laws, regulations, and standards. Different countries may have varying standards and legal provisions, not covered in this manual. In such cases, contact our after-sales service at Tel: +852 2884 4318, Fax: +852 2884 4816, or Email: [www.sunsynk.com / sales@sunsynk.com](mailto:sales@sunsynk.com).

HV-Series Set

Model	System Energy	Rated DC Power	Discharge Depth	Composition
SUNSYNK-W25	25.6kWh	25.6kW	90%	SUNSYNK-W-PACK5.1*5+SUNSYNK-W-PDU*1
SUNSYNK-W30	30.72kWh	30.72kW		SUNSYNK-W-PACK5.1*6+SUNSYNK-W-PDU*1
SUNSYNK-W35	35.84kWh	35.84kW		SUNSYNK-W-PACK5.1*7+SUNSYNK-W-PDU*1
SUNSYNK-W40	40.96kWh	40.96kW		SUNSYNK-W-PACK5.1*8+SUNSYNK-W-PDU*1
SUNSYNK-W45	46.08kWh	46.08kW		SUNSYNK-W-PACK5.1*9+SUNSYNK-W-PDU*1
SUNSYNK-W50	51.2kWh	51.2kW		SUNSYNK-W-PACK5.1*10+SUNSYNK-W-PDU*1
SUNSYNK-W55	56.32kWh	56.32kW		SUNSYNK-W-PACK5.1*11+SUNSYNK-W-PDU*1
SUNSYNK-W60	61.44kWh	61.44kW		SUNSYNK-W-PACK5.1*12+SUNSYNK-W-PDU*1
SUNSYNK-W65	66.56kWh	66.56kW		SUNSYNK-W-PACK5.1*13+SUNSYNK-W-PDU*1
SUNSYNK-W70	71.68kWh	71.68kW		SUNSYNK-W-PACK5.1*14+SUNSYNK-W-PDU*1
SUNSYNK-W75	76.8kWh	76.8kW		SUNSYNK-W-PACK5.1*15+SUNSYNK-W-PDU*1
SUNSYNK-W80	81.92kWh	81.92kW		SUNSYNK-W-PACK5.1*16+SUNSYNK-W-PDU*1
SUNSYNK-W85	87.04kWh	87.04kW		SUNSYNK-W-PACK5.1*17+SUNSYNK-W-PDU*1

Battery Expansion and Use

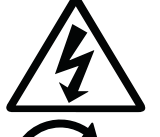
- For optimal performance, the production date of original and newly added batteries should ideally be within one year of each other. Significant time differences in production can lead to large capacity deviations and underutilization of energy from the batteries.
- Before expanding the system, ensure the original batteries are fully charged to 100% SOC (State of Charge), followed by charging the additional batteries to 100% SOC separately. Then, assemble them for expansion. Original batteries can be charged using the inverter, while newly added batteries should be charged separately with a battery charger.
- Consult relevant technical personnel before expanding the system to avoid personal misoperation. Any consequences resulting from personal misoperation are not covered by the Sunsynk warranty.
- The Sunsynk lithium battery must not operate in Lead-acid Mode. Any failures due to using a Lead-acid model are not covered by the Sunsynk warranty.

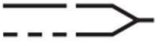
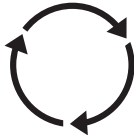
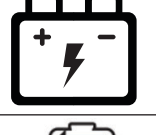
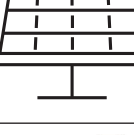
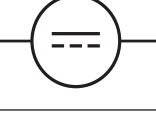
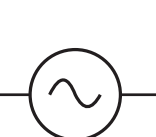
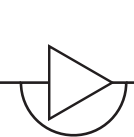
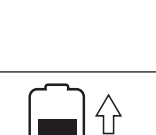
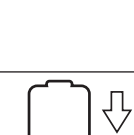
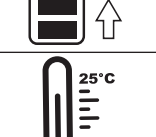
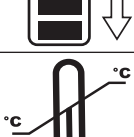
Meaning of Symbols

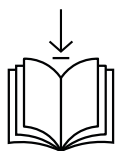
 WARNING	This symbol indicates information that if ignored, could result in personal injury or even death due to incorrect handling.
 CAUTION	This symbol indicates information that if ignored, could result in personal injury or physical damage due to incorrect handling.
 DANGER	This symbol indicates that the operation may cause electric shock.
PLEASE NOTE	Indicates information that is considered important, but not hazard-related.

Symbols on Equipment

The following types of warning, prohibition, and mandatory symbols are also used on the equipment.

 Do not short-circuit.	 CE mark is attached to the solar inverter to verify that the unit follows the provisions of the European Low Voltage and EMC Directives.
 Risk of danger.	 Warning: Hot surface.
  Risk of electric shock. DO NOT touch the terminal or remove the shell within 5 minutes after disconnecting all power.	 The UKCA marking is used for products placed on the market in Great Britain (England, Scotland and Wales). The UKCA marking applies to most products for which the CE marking could be used.
 This product's batteries contain an explosive, self-reactive material that could blow up when heated.	 Do not disassemble or alter the battery in any way. Do not strike or puncture the battery.
 The Battery is heavy and can cause injury if not handled safely.	 ONLY qualified personnel should install or perform maintenance work on the units.
 Be careful when touching the inverter! It is an electrical product with risk of electric shock and heating.	 Warranty Void if Seal is Broken.
 Do not place near open fire or incinerate. Do not use near heaters or hot temperature sources.	 Keep the product out of reach of children!
 Do not stand on.	 Avoid unsuitable shoes for installing and operating the inverter.
 Do not step or put any objects onto the battery.	 Do not drop, deform, or impact the battery.

 Max PV input current.	 Recommended Charge Instructions.
 Single Phase.	 Three Phase.
 Protective Conductor Terminal or Earth Ground Terminal.	 Rechargeable.
 Do not submerge the battery in water or expose it to moisture or liquid.	 Keep out of reach of children, animals, and insects.
 Do not expose the product to sunlight.	 Inverter DC to AC.
 Li-ion Battery.	 Do not allow battery to get wet.
 Battery Voltage Range.	 Net Weight in Kilograms.
 BATTERY INPUT Battery Discharge Voltage, Battery Discharge Current, Input Voltage Type, Battery Discharge Power.	 PV INPUT PV Input Voltage, Number of MPPT's, MPPT Input Current & Max PV ISC.
 Direct Current.	 Recharge every 3 months.
 AC OUTPUT Output Voltage, Input Voltage Type, Ac Output Rated Current, Max AC Current, Output Frequency, Max AC ISC, Power Factor & AC Output Rated Power.	 CONTINUOUS OUTPUT CURRENT Maximum Continuous Output Current, Output Frequency and Voltage, & AUX (programmable AC output on battery SOC).
 Charging.	 Discharging.
 Follow the indicated temperatures.	 TEMPERATURE Ambient, Min & Max.



MANUAL DOWNLOAD

Download the latest version of the instruction manual by scanning the QR code.



WARRANTY REGISTRATION

Scan the QR code to access our website and sign up for the manufacturer's warranty.



Do not dispose the device, accessories, and packaging with regular waste. Follow local ordinances or contact the manufacturer for disposal guidance.



Refer to the operating instructions. Contact the supplier within 24 hours if there is anything wrong. In case of leakage contact with eyes or skin, immediately clean with water and seek help from a doctor.



Indicates that this product is recyclable.

General Safety Information



WARNING

Failure to comply with the safety information can lead to life-threatening situations.

1. Improper use can cause death. Operators of SUNSYNK-W must read this manual and observe all safety information.
2. Operators of SUNSYNK-W must comply with the specifications in this manual.
3. This manual cannot describe all conceivable situations. For this reason, applicable standards and relevant occupational health and safety regulations are always given priority.
4. In addition, the installation may involve residual hazards in the following circumstances:
 - a. Incorrect installation.
 - b. The installation is carried out by personnel who did not receive relevant training or guidance.
 - c. Failure to observe the warnings and safety information in this manual.

If there are any questions, please contact Sunsynk support after service.

Disclaimer

Sunsynk Ltd shall not be liable for personal injury, property loss, product damage and subsequent losses under the following circumstances.

- Failure to comply with the provisions of this manual.
- Incorrect use of this product.
- Unauthorized or unqualified personnel repair the product, disassembly the rack and perform other operations.
- Use of unapproved spare parts.
- Unauthorized modifications or technical changes to the product.

Installation Environment

- The battery energy storage system can only be installed and operated in an enclosed space. The working environment temperature range of SUNSYNK-W is -20°C~ 55°C, and the maximum humidity is 85%. The battery module shall not be exposed to the sun or placed directly beside the heat source.
- The battery module shall not be exposed to a corrosive environment.
- When installing the battery energy storage system, ensure that it stands on a sufficiently dry and flat surface with sufficient bearing capacity. Without the manufacturer's written approval, the installation site's altitude shall not be higher than 3000 metres. The output power of the battery decreases with the altitude.
- In areas where flooding may occur, care must be taken to ensure that the battery module is installed at a suitable height and to prevent its contact with water.
- The battery energy storage system must be installed in a fireproof room. This room must have no fire source and must be equipped with an independent fire alarm device, which complies with local applicable regulations and standards. According to local applicable regulations and standards, the room must be separated by the T60 fire door. Similar fire-proof requirements apply to other openings in the room (such as windows).

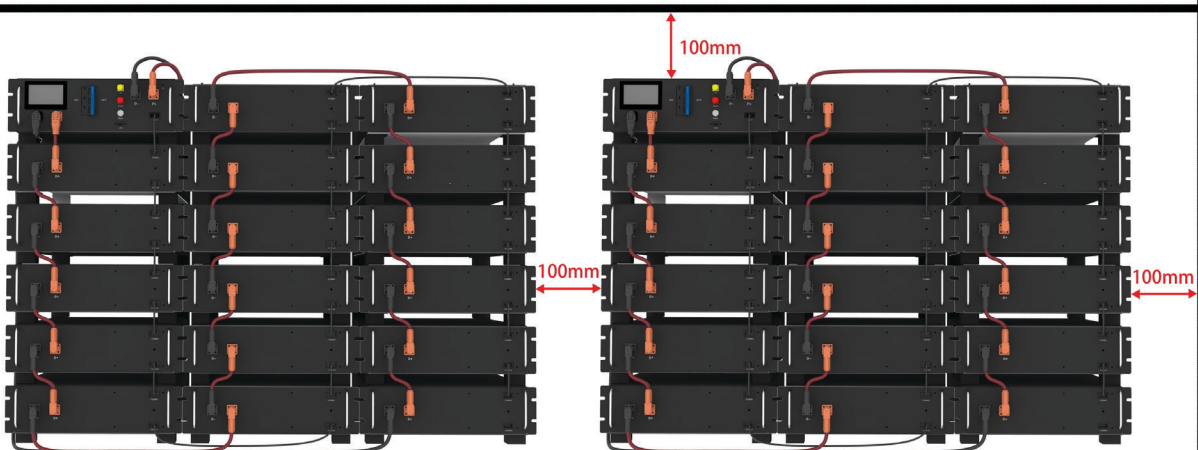
Compliance with the specifications in this manual is also part of proper use.

The use of the SUNSYNK-W system is prohibited in the following circumstances:

- Mobile use on land or in the air (use on water only with the manufacturer's consent and with the manufacturer's written consent).
- Used in medical devices.
- Used as a UPS system.

Minimum product installation distance

- The minimum distance to the surrounding building when the battery is installed is 600mm, and the minimum distance between the two products is 100mm.



Quality Certificate

The quality certificate can be downloaded from www.sunsynk.com.

Requirements for Installation Personnel

All work shall comply with local applicable regulations and standards.

The installation of SUNSYNK-W can only be completed by electricians with the following qualifications:

- Trained in dealing with hazards and risks associated with the installation and operation of electrical equipment, systems, and batteries.
- Trained on installation and debugging of electrical equipment.
- Understanding and complying with the technical connection conditions, standards, guidelines, regulations, and laws applicable.
- Knowledge of handling lithium-ion batteries (transportation, storage, disposal, hazard source).
- Understanding and complying with this document and other applicable documents.
- Installation video of SUNSYNK-W can be found at www.sunsynk.com or contact us via email: support@sunsynk.com

SAFETY

Safety Rules

To avoid property damage and personal injury, the following rules shall be followed when working on the hazardous live parts of the battery energy storage system:

- It is available for use.
- Ensure that it will not restart.
- Make sure there is no voltage.
- Grounding protection and short circuit protection
- Cover or shield adjacent live parts.

Safety Information

Part damage or short circuit may cause electric shock and death. A short circuit can be caused by connecting battery terminals, resulting in current flow. This type of short circuit shall be avoided under any circumstances. For this reason, follow these instructions:

- Use insulated tools and gloves.
- Do not put any tools or metal parts on the battery module or high-voltage control box.
- When operating the battery, be sure to remove watches, rings, and other metal objects.
- Do not install or operate this system in explosive or high-humidity areas.
- When working on the energy storage system, first turn off the charging controller, then the battery, and ensure that they are not turned on again.



WARNING

- Improper use of the battery energy storage system can lead to death. The use of the battery energy storage system beyond its intended use is not allowed, because it may cause great danger.
- Improper handling of the battery energy storage system can cause life-threatening risks, serious injury or even death.



CAUTION

Improper use can cause damage to the battery cell.

- Do not expose the battery module to rain or soak it in liquid.
- Do not expose the battery module to a corrosive environment (such as ammonia and salt).
- The battery energy storage system shall be debugged no later than six months after delivery.

TRANSPORT TO THE END CUSTOMERS

Provisions on Shipping of Battery Modules

It is necessary to comply with the relevant regulations and provisions on roads for shipping lithium-ion products in the corresponding countries.



WARNING

- It is prohibited to smoke in the vehicle during transportation or in the vicinity during loading and unloading.
- The dangerous goods transport vehicles shall meet relevant regulations concerning road transportation and shall be equipped with two tested CO₂ fire extinguishers.
- It is forbidden for the freight forwarder to open the outer package of the battery module. Use only approved lifting equipment to move the battery cabinet system. Use only the hanging lug on the top of the battery cabinet as the connection point. When lifting, the angle of the sling must be at least 60°.
- Improper vehicle transportation can cause injury. Improper transportation or improper transportation locks may cause the load to slip or overturn, resulting in injury. The cabinet shall be placed vertically to prevent it from sliding in the vehicle, and a fixing belt shall be used.
- A tilting of the battery rack may cause injury. The maximum weight of a single battery rack of SUNSYNK-W can reach 368 kg. When tilted, they may overturn, causing injury and damage. Ensure that the battery cabinet is on a stable surface and that it does not tilt due to load or force.
- The battery energy storage system can be damaged, if not properly transported. The battery module can only be transported vertically. Note that these parts may be top-heavy. Failure to follow this instruction may result in damage to the part.
- During transportation, the battery storage rack may be damaged when it is installed with the battery module. The battery storage rack is not designed to be transported with the installed battery modules. Always transport the battery module and the battery rack separately. Once the battery module is installed, do not move the battery rack, and do not lift it by a lifting device.
- If possible, do not remove the transport packaging before arrival at the installation site. Before removing the transport protector, check if the transport packaging is damaged, and check the impact indicator on the outer packaging of the battery converter. If the impact indicator is triggered, the possibility of transport damage cannot be ruled out.



WARNING

- Improper transportation of battery modules may cause injury. The single battery module weights 44kg. If it falls or slips, it may cause injury. Only use suitable transport and lifting equipment to ensure safe transport.
- Wear safety shoes to avoid the danger of injury. When transporting the battery rack and battery module, their parts may be crushed due to their heavy weight. Therefore, all persons involved in transportation must wear safety shoes with toe caps. Please observe the safety regulations for transportation at the end customer's site, especially during loading and unloading.
- During transportation and installation of unpacked battery storage cabinets, the risk of injury increases, especially on sharp metal panels. Therefore, all personnel involved in transportation and installation must wear protective gloves.
- We suggest that at least 2-3 people work together to install the battery rack. The lifting device is helpful for heavy parts, and the pulley or cart for light parts. Be careful not to damage the case. The number of battery modules stacked shall not be more than 7.

Check whether the delivery is complete.

Package Storage Positions

Battery Module

The battery module can only be transported in an upright position. Please note that the battery rack may be very top-heavy.



DESCRIPTION AND INSTALLATION

Installation Precautions



CAUTION

Possible damage to the building due to static overload.

1. Ensure that the installation site has sufficient bearing capacity according to total weight of the battery storage system.
2. When selecting the installation site, consider the transportation route and necessary site cleanup.
3. Installation levelness: The allowable deviation is less than 5mm

Product Description

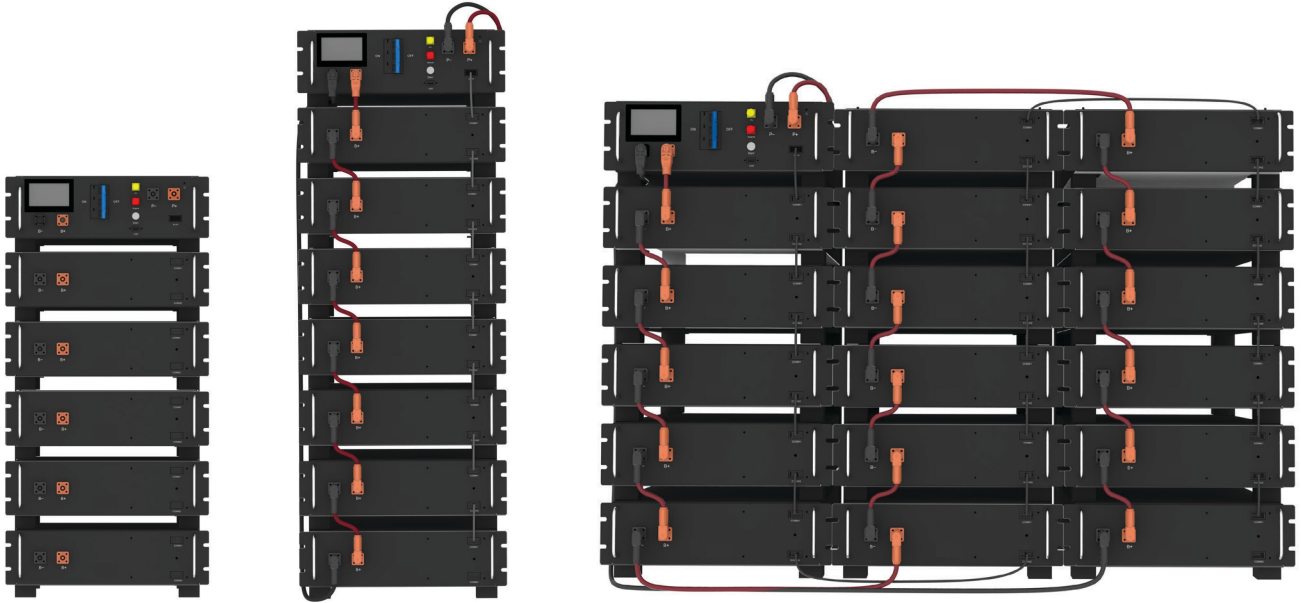
SUNSYNK-W is a high-voltage lithium-ion battery system. It provides a reliable backup power supply for supermarkets, banks, schools, farms and small factories to smooth the load curve and achieve peak load transfer. It can also improve the stability of renewable systems and promote the application of renewable energy.

It is characterized by high integration, good reliability, long service life, wide working temperature range, etc. The battery energy storage system is modular. Each battery module boasts a capacity of 5.12kWh. The complete system supports 17 battery modules in series, Its total energy can be expanded from 25.6 kWh to 87.04 kWh.

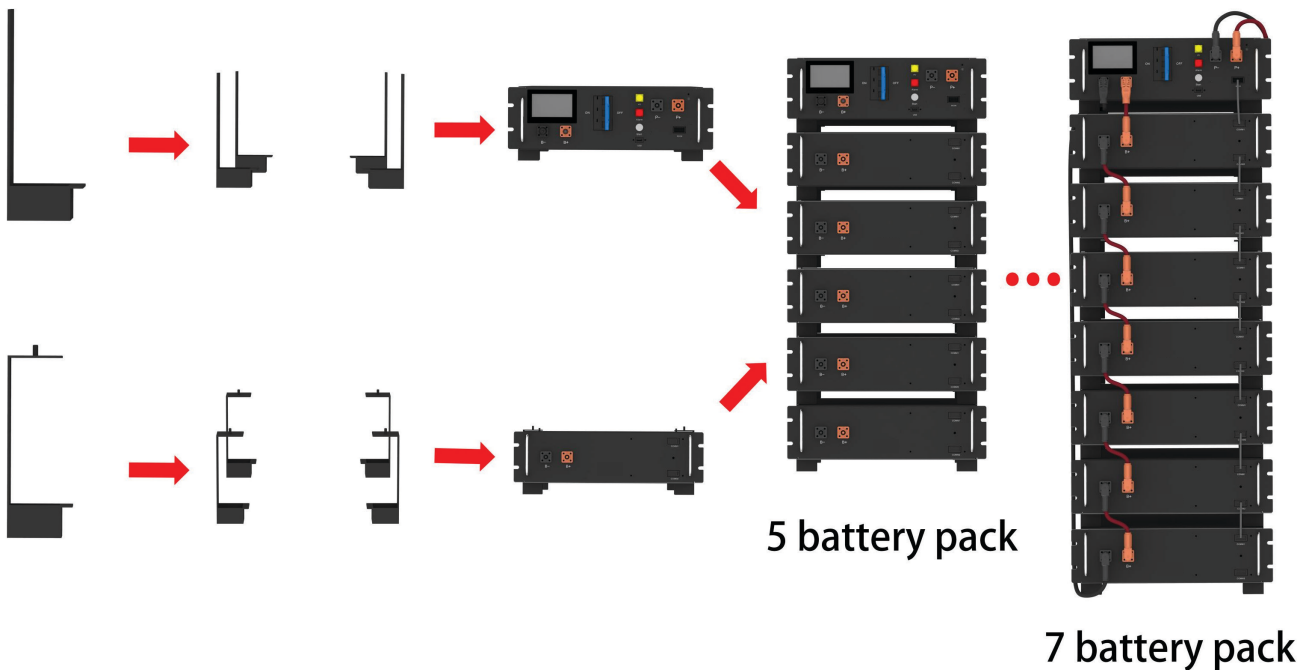


Product Selection

1. Our product range is designed to meet diverse application requirements. Customers can typically select between 5 to 17 modules, depending on their needs.
2. Our products are designed to work in a stacked configuration. When connecting battery modules in a single cluster, the number of modules should not exceed 7. Note: This does not include the high-voltage box.
3. The image below illustrates the different stacking configurations available:



The installation procedure of the simple mounting rack is shown in the figure.



Technical Data

Note

Approvals and certification are subject to change without prior notice. Please confirm the current status with Sunsynk before placing an order.

Model		SUNSYNK-WX (X=25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85)			
Main Parameter					
Battery Cell Chemistry		Lithium Ferro Phosphate (LiFePO ₄ or LFP)			
Module Energy		5.12kWh			
Module Nominal Voltage		51.2V			
Module Capacity		100Ah			
Battery Module Number		SUNSYNK-W25	SUNSYNK-W40	SUNSYNK-W60	SUNSYNK-W85
Battery Module Qty in Series (Optional)		5 (Min.)	8	12	17 (Max.)
System Nominal Voltage		256V	409.6V	614.4V	870.4V
System Operating Voltage		220~292V	352~467.2V	528~700.8V	748~992.8V
System Energy		25.6kWh	40.96kWh	61.44kWh	87.04kWh
System Usable Energy ^[1]		23.04kWh	36.86kWh	55.3kWh	78.33kWh
Rated DC Power		25.6kW	40.96kW	61.44kW	87.04kW
Charge/Discharge Current ^[2]	Recommended	50A			
	Nominal	100A			
	Peak Discharge (2mins, 25 °C)	125A			
Working Temperature		Charge: 0~55/Discharge: -20~55 °C			
Status Indicator		Yellow: Battery High Voltage Power On Red: Battery System Alarm			
Communication Port		CAN2.0/RS485			
Humidity		5%~85%RH			
Altitude		≤3000m			
IP Rating of Enclosure		IP20			
Dimensions (WxDxHmm)		530x602x1629		530x602x2219	1060x602x1629
Weight Approximate		290kg	428kg	622kg	883kg
Installation Location		Rack Mounting			
Integrated Fire Suppression		Aerosol			
Storage Temperature		0~35°C			
Recommend Depth of Discharge		90%			
Cycle Life		25±2°C, 0.5C/0.5C, EOL70%≥6000			
Warranty ^[3]		See website for Warranty details			
Certification		UN38.3			

^[1] DC Usable Energy, test conditions: 90% DOD, 0.3C charge & discharge at 25°C. System usable energy may vary due to system configuration parameters.

^[2] The current is affected by temperature and SOC.

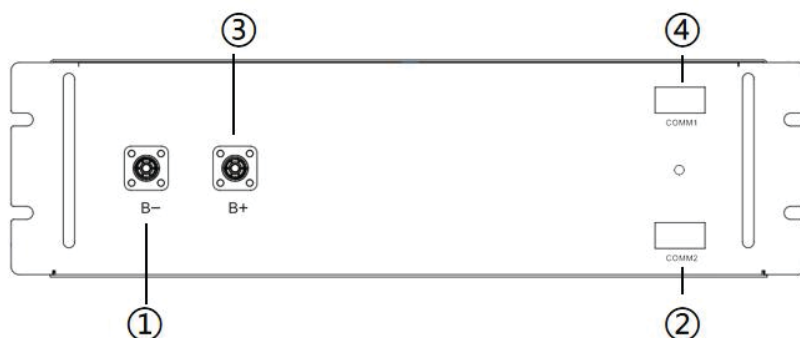
^[3] The warranty is due whichever reached first of warranty period, life cycle power.

PREPARATION

Tools Required

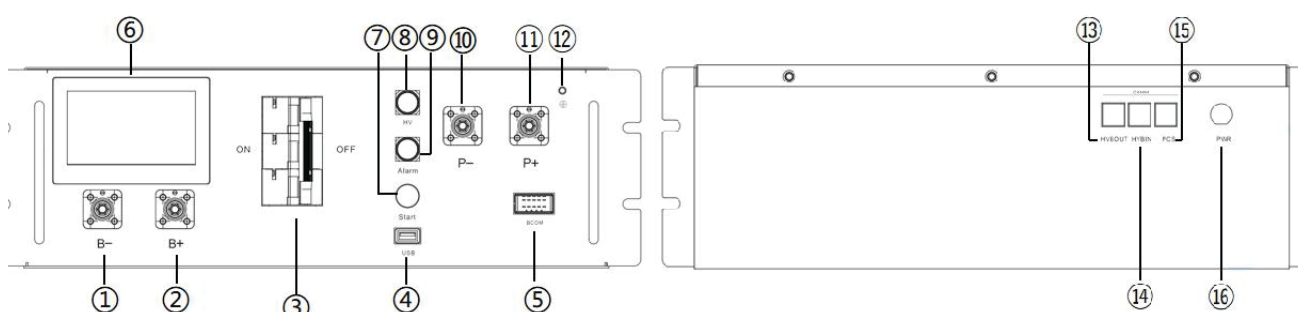
Tool	Use
Phillips screwdriver	With M4*8 countersunk head screws, lock the screws on the side of the support to secure the overall support.
M6 Socket	Use M6*20 hexagon assembly and flange nut to secure the ground cable between the battery packs.

Description of Battery Module



No.	Name	Description
1	B-	Battery module negative pole (black)
2	COMM2	Connection position of battery module communication and power supply output
3	B+	Battery module positive pole (orange)
4	COMM1	Connection position of battery module communication and power supply input

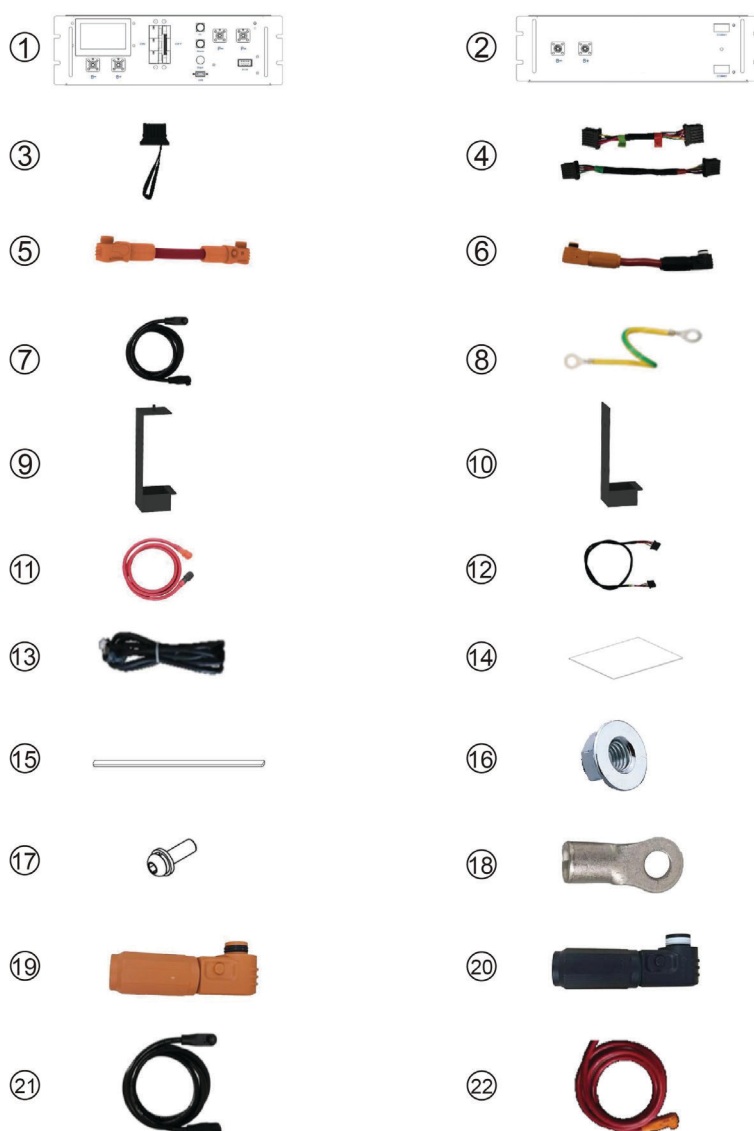
Description of High-Voltage Control Box



No.	Name	Description
1	B-	Connection position of the common negative pole of the battery (black)
2	B+	Connection position of the common positive pole of the battery (orange)
3	Air Switch	It is used to manually control the connection between the battery rack and external devices
4	USB	BMS upgrade port and storage expansion port
5	BCOM	Communicative connection with the first battery module, and providing 12VDC power for the first battery module.

No.	Name	Description
6	Human-Machine Interface (HMI)	Display some important battery information.
7	START	A start switch of 12VDC power inside the high-voltage control box
8	HV Light Indicator	High-voltage hazard indicator (yellow)
9	ALARM Light Indicator	Battery system fault alarm indicator (red)
10	PCS-	PCS negative connection position (black)
11	PCS+	PCS positive connection position (orange)
12	Ground Wire Identification	Connection to the battery rack and the ground point.
13	OUT COM	Connection position with next SUNSYNK-W communication output
14	IN COM	Connection position with previous BOS-A-PDU-2 communication input
15	PCS COM	PCS COM battery communication terminal: (RJ45 port) follow the CAN protocol (default baud rate: 500bps) and RS485 protocol (default baud rate:9.6bps), used to output battery information to the inverter.
16	POWER	Connection position of external 12VDC power supply.

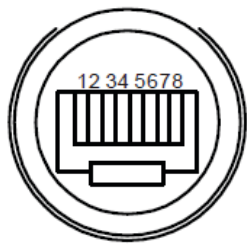
Description of Battery Module in Rack



No.	Description	Type	Quantity
1	High-voltage control box 1000V/100A		1
2	5.12kWh battery module (general)		1
3	120ohm terminal resistor	Standard	1
4	Communication cable (160mm for battery module, 250mm for high-voltage control box) CAT5E FTP 26AWG black	Standard	2
5	140mm positive power cord of high-voltage control box UL 10269 4AWG red	Standard	1
6	200mm power cord of battery module UL 10269 4AWG red	Standard	1
7	The negative power cord of the high-voltage control box 2500mm UL 10269 4AWG black	Standard	1
11	1000mm power cable between the two battery racks	Standard	2
12	1000mm communication cable between the two battery racks	Standard	2
13	2000mm network cable	Standard	1
14	Heat insulation foam	Optional	2
15	Rubber pad	Standard	2
Per battery module include:			
8	Ground wire A (ground wire B for external connection of battery rack is not provided) UL 1015 10AWG yellow green	Standard connecting cable A (connecting the high-voltage control box)	1
9	Battery rack	Standard	4
16	M6 Hexagon nut	Standard	1
17	Screw	Standard	4
Per high-voltage box include:			
8	Ground wire A (ground wire B for external connection of battery rack is not provided) UL 1015 10AWG yellow green	Standard connecting cable A (connecting the high-voltage control box)	1
10	Simple mounting bracket (per high-voltage boxes)	Standard	4
16	M6 Hexagon nut	Standard	1
17	Screw	Standard	4
Only for 10100303000074			
18	OT terminal	Standard	2
19	EP cable positive connector terminal	Standard	1
20	EP cable negative connector terminal	Standard	1
Only for 10100303000078			
21	2 meter power cable connected to the negative pole of the external PCS	Standard	1
22	2 meter power cable connected to the positive pole of the external PCS	Standard	1

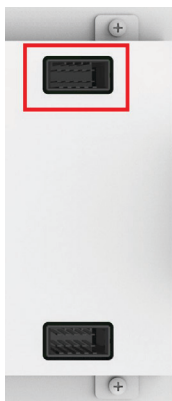
Definition of PCS communication interface

Pin No.	PCS Port Definition	IN Port Definition	OUT Port Definition	Definition of Power
1	485B-	BMS_CANL	BMS_CANL	12V
2	485A+	BMS_CANH	BMS_CANH	GND
3	--	DI+	DO2+	--
4	PCANL	DI-	DO-	--
5	PCANH	--	--	--
6	--	--	--	--
7	485A+	--	--	--
8	485B-	--	--	--



Defines the external interface of a battery pack

Definition of the battery module interface			
Pin No.	COMM1	Pin No.	COMM2
1	INT_CANH	1	INT_CANH
2	DI-	2	DI-
3	DI+	3	DI+
4	PGND	4	PGND
5	/	5	/
6	INT_CANH	6	INT_CANH
7	DO+	7	DO+
8	DI+	8	DI+
9	BMU_L+	9	BMU_L+
10	/	10	/



Battery Module Installation on Rack



DANGER

Insufficient or no grounding may cause an electric shock. Device malfunctions, and insufficient or no grounding may cause device damage and life-threatening electric shocks.



CAUTION

Remember that this battery is heavy so users must be careful in lifting out from the package.

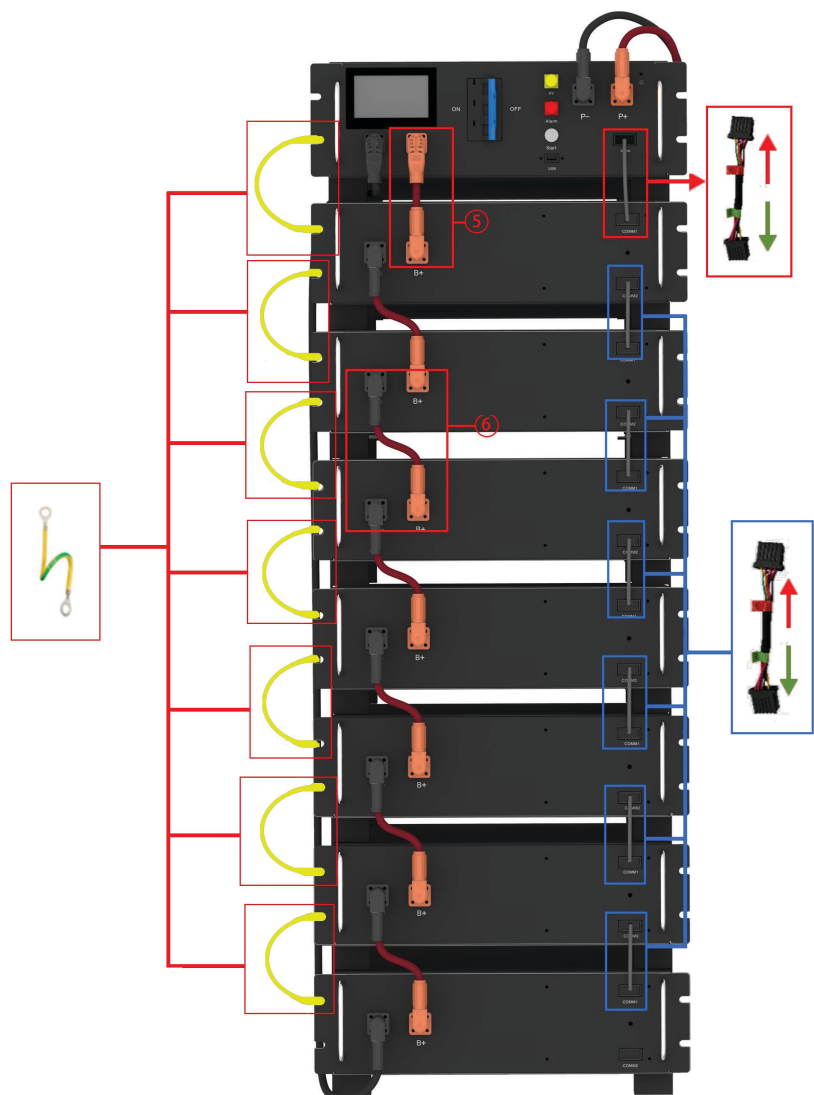
PLEASE NOTE

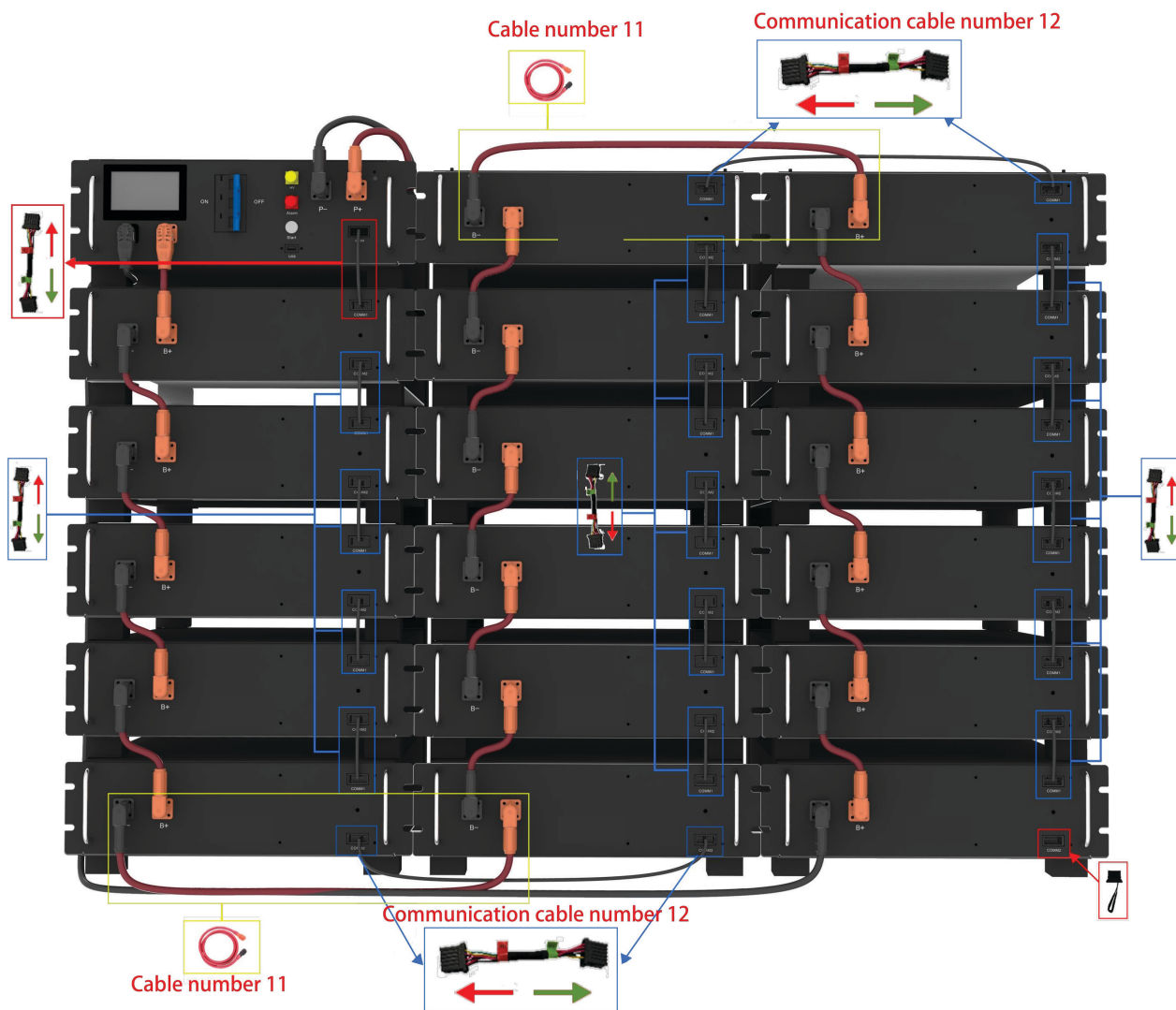
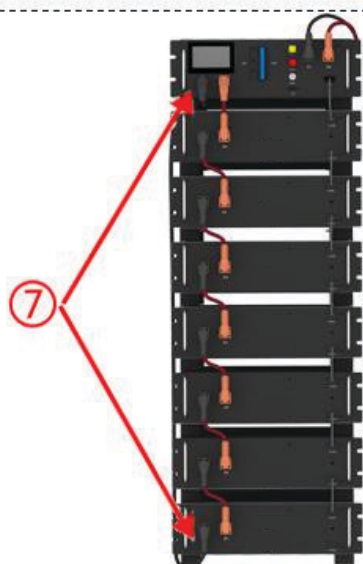
Before installing the battery, please turn the manual switch of the high-voltage control box to the off position.

Before installing the battery, the minimum distance to the surrounding buildings or other objects is 5mm.

Battery installation Cable Description

- Use cable No. 6 to connect the B+ and B- terminals between battery packs.
- Connect the B+ terminal of the control box to the B+ terminal of the battery pack using cable No. 5.
- The connection between the high voltage box and the battery pack is 250MM cable in No. 4, and the connection between the battery pack and the battery pack is 160mm cable in No. 4.
- The ground cable between the high-voltage box and the battery pack, as well as between individual battery packs, should use the No. 8 ground cable.
- Use the No. 12 communication cable to connect one cluster battery rack to another.
- Connect the B+ port of one battery cluster to the B- port of another battery cluster using cable No. 11.

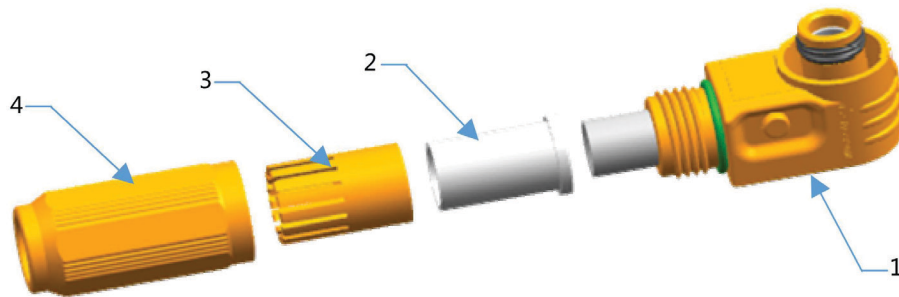




The control box B- and bottom battery pack B- are connected using cable No. 7.

Wiring Instructions

Package Contents



- 1. Socket Package
- 2. Grommet
- 3. Gripping Jaw
- 4. Nut

Plug Assembly Instruction

Step 1: Strip off the jacket of the cable.



A: The length of the stripped wire of the plug (See table I)

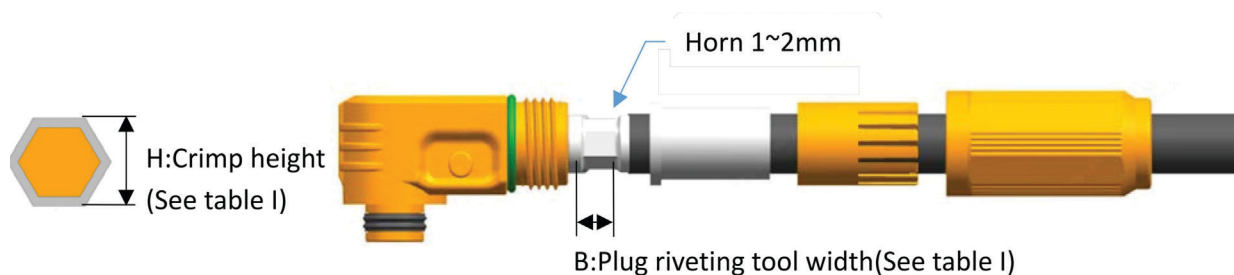
Step 2: Put the nut, the Grommet and the gripping jaw on the cable as shown.



Step 3: Insert the conductor into the lug.



Step 4: Crimping the lug as shown (A 1~2mm horn is left out of the tail cable to prevent crushing the conductor).

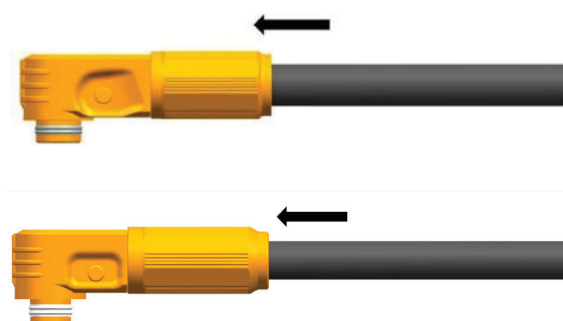


No.	Electric Current	The length of the stripped wire of the plug A (mm)	Plug riveting tool width B (mm)	Suggested crimp height of the plug H (mm)	Compression Ratio	Cable Square (mm ²)	Cable outside diameter (mm)
1	100A	13~14	6~7	6.5± 0.2	75%~80%	16	7.5~9
2	120A			7.3± 0.2		25	9~10.3

PLEASE NOTE

The recommended crimp sizes are only for reference. The customer should adjust them according to cable specification and crimp tool and test results including temperature rise and metallographic analysis and pullout force.

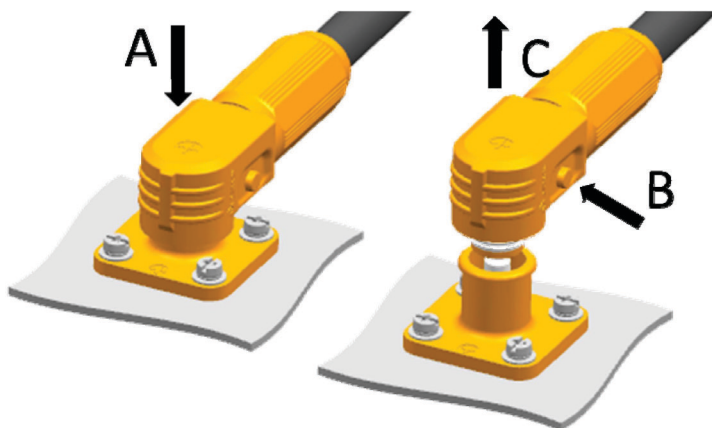
Step 5: Push the seal, the jaw and the nut into the socket, then screw it.



Step 6: Schematic diagram of matching plug and socket.

1. Connecting the Socket

- Once the socket is installed, you can connect it directly without pressing the button.
- The connection is complete when you hear a "click" sound.
- To ensure proper assembly, gently pull the socket upward to verify that it is securely in place and cannot be removed.



2. Disconnecting the Plug

- Before disconnecting the plug, make sure to turn off the power.
- Press the release button and then carefully pull out the plug.



WARNING

Power-Storage Connector:

1. The connector can only be used in combination, for indoor use only.
2. Only qualified electrical professionals may install and operate the product.
3. Do not disconnect the connector under load.
4. The product can only be used in the situation of overvoltage protection devices.
5. Only allow to connect "+" with "+", and "-" with "-".
6. Risk of burns.
7. The connector heats up during operation.
8. It can heat up to 115°C , depending on the environmental conditions. In this case, the user is responsible for attaching warnings.

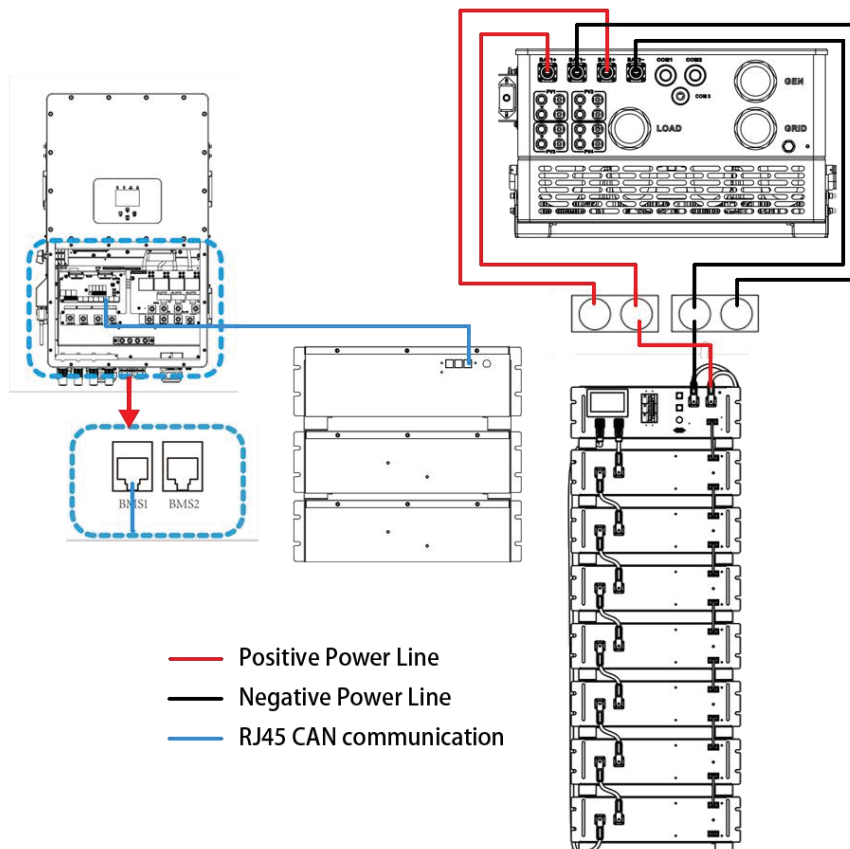
Battery Cluster Connected to Inverter

For the Australian Market, an overcurrent protection and isolation device that isolates both positive and negative conductors simultaneously is required between the battery system and inverter.

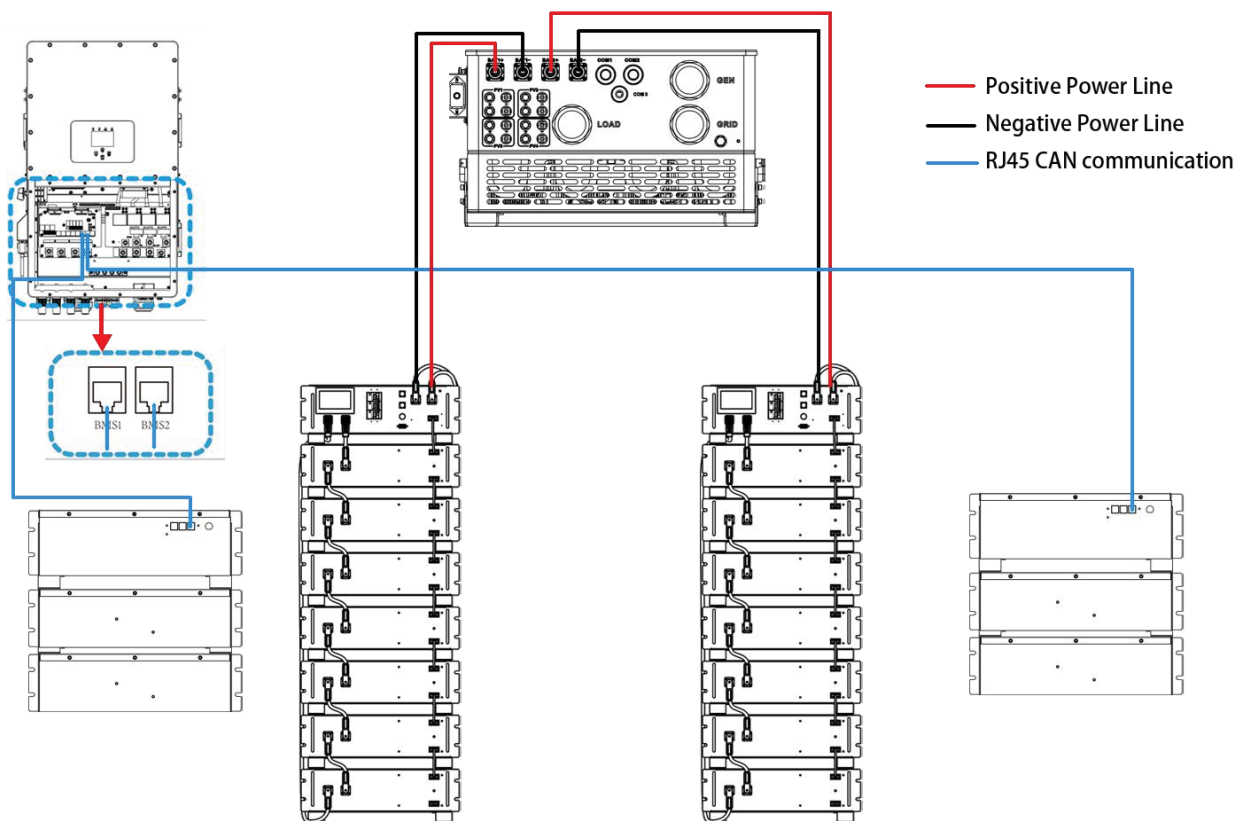
PLEASE NOTE

The length of the communication line between the inverter and the battery should not exceed 30m.

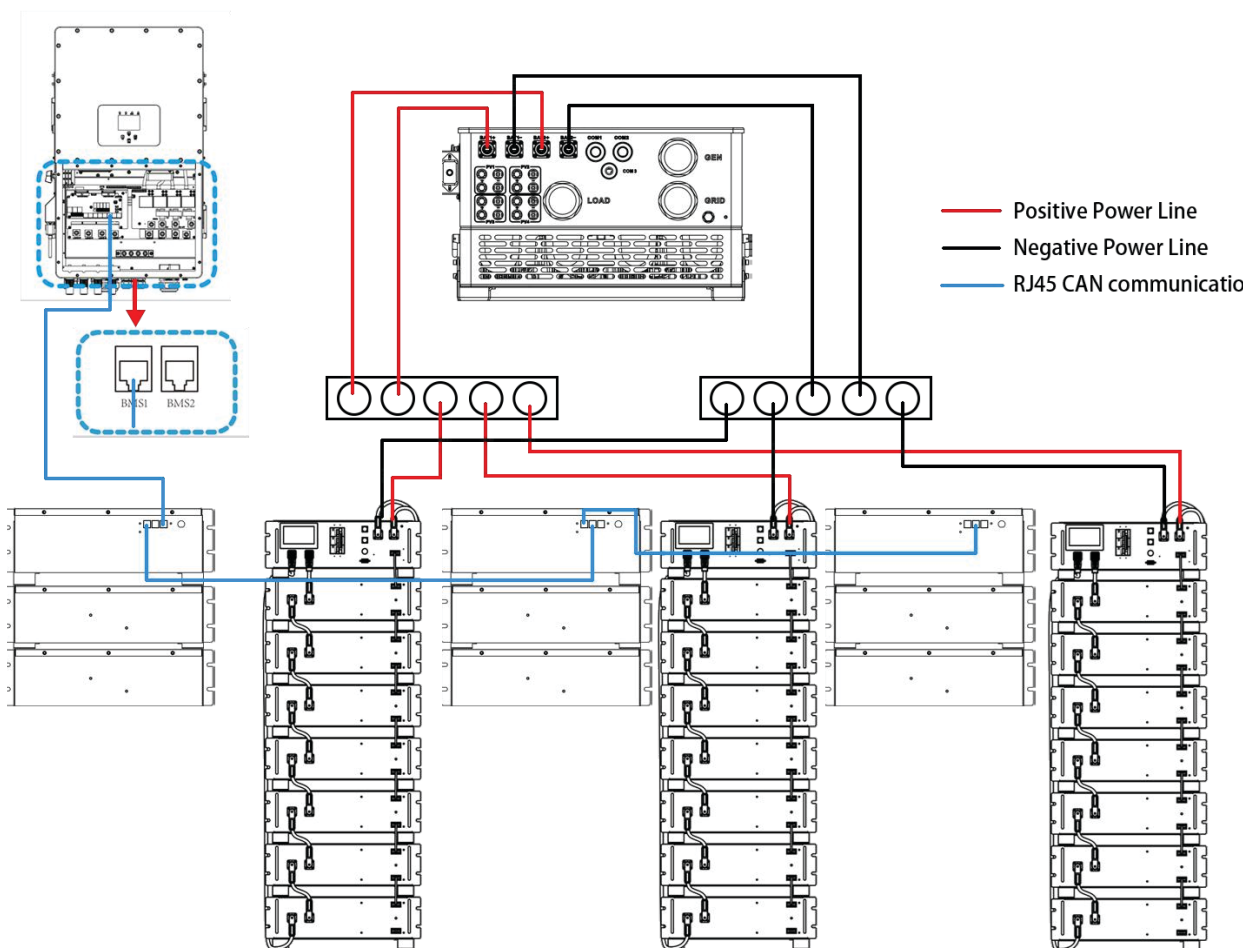
Single Battery Cluster Connected to Inverter



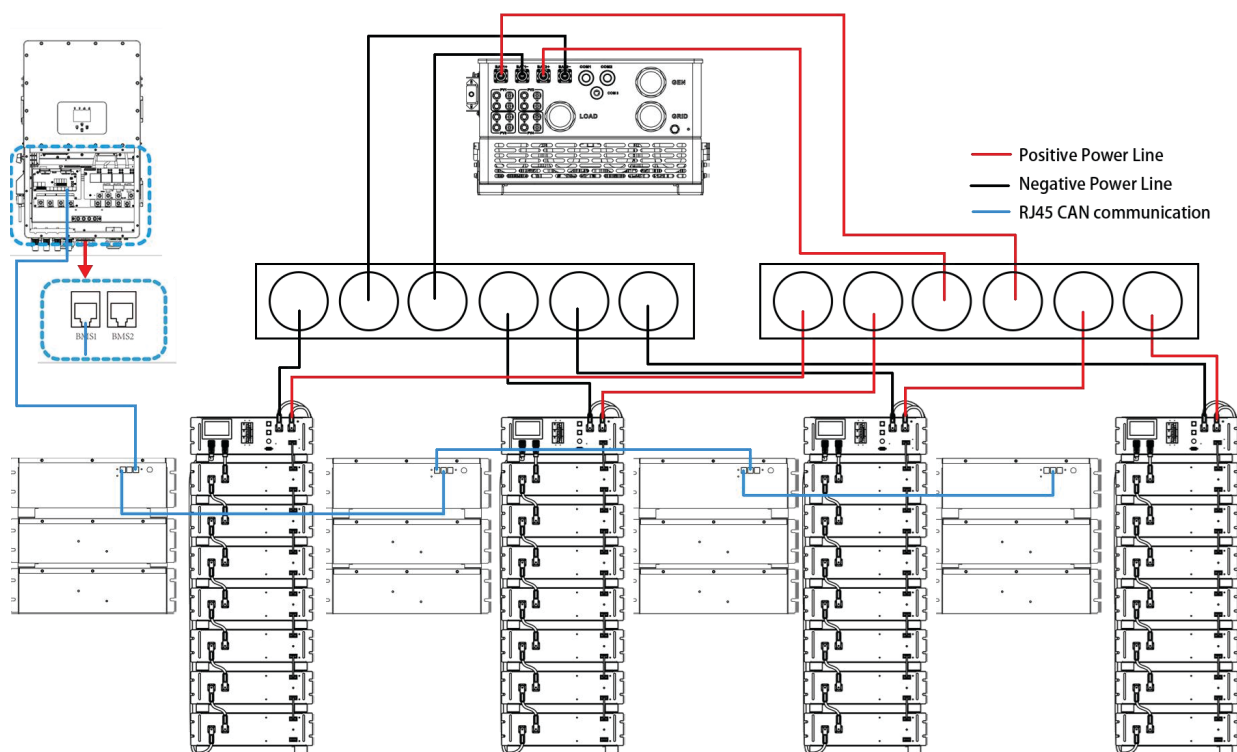
Two Battery Clusters Connected to Inverter



Three Battery Clusters Connected to Inverter



Multiple Battery Packs are Connected to the Inverter



The number of battery packs in each cluster must be the same in each group, and the number of battery packs in group A and Group B can be different.

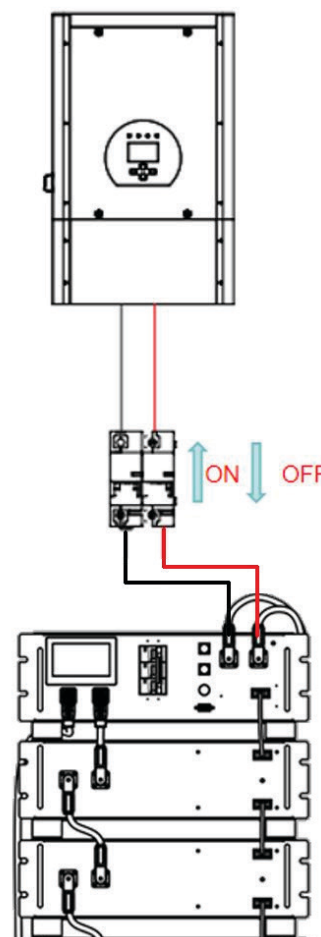
System Startup and Shutdown

Startup Procedure

1. After connecting the battery cables, press the air switch button on the high-voltage control box to turn OFF to ON.
2. Press the start button and wait for the screen to light up.
3. Turn on the circuit breaker between inverter and battery system after the battery pack is started.

Shutdown Procedure

1. Press the start button again and wait for the screen to go off.
2. Press the air switch button ON the high pressure control box and set the "ON" to the "OFF" position.
3. Turn off the circuit breaker between inverter and battery system after the battery pack is closed.



External 12V Power Supply of High-Voltage Control Box

To operate the high-voltage control box with an external 12V power supply, please contact our service personnel. Hotline: +852 2884 4318, Email: support@sunsynk.com.

In the factory configuration, the high-voltage control box is supplied with working voltage from an internal power supply unit. If your plan requires an external 12V power supply, an adaptive version and a high-voltage control box can be provided as requested. Please contact our after-sales service personnel for details.

FAULT DESCRIPTION

Different types of faults are below:

Fault Types	Trigger Conditions
Charge over-current alarm	Exceeding the parameter set value and set time (More than 105A, 2s; more than 125A, 5s; more than 140A, 2s; lower than 5°C, set value*0.5)
Charge over-current protection	
Discharge over-current alarm	
Discharge over-current protection	
Charge overtemperature alarm	Exceeding the parameter set value and set time (>45°C, 25)
Charge overtemperature protection	Exceeding the parameter set value and set time (>50°C, 2s)
Discharge overtemperature alarm	Exceeding the parameter set value and set time (>50°C, 2s)
Discharge overtemperature protection	Exceeding the parameter set value and set time (>55°C, 2s)
Charge under temperature alarm	Exceeding the parameter set value and set time (<5°C, 2s)
Charge under temperature protection	Exceeding the parameter set value and set time (<0°C, 2s)
Discharge under temperature alarm	Exceeding the parameter set value and set time (<-10°C, 2s)
Discharge under temperature protection	Exceeding the parameter set value and set time (<-20°C, 2s)
Excessive differential voltage alarm	Exceeding the parameter set value and set time (>500mv, 2s)
Excessive differential voltage protection	Exceeding the parameter set value and set time (>800mv, 2s)
Excessive differential temperature alarm	Exceeding the parameter set value and set time (>10°C, 2s)
Excessive differential temperature protection	Exceeding the parameter set value and set time (>15°C, 2s)
Cell overvoltage alarm	To maintain consistency, cut off the charging immediately when the full charge calibration rated voltage of 3.6V is reached. When the voltage drops to 3.35V, restart it with the turned off red light indicator All protective red light indicators are always on!
Cell overvoltage protection	
Cell undervoltage alarm	
Cell undervoltage protection	
Pre-charge resistor overtemperature alarm	Exceeding the parameter set value and set time (>55°C, 2s)

Fault Types	Trigger Conditions
Pre-charge resistor overtemperature protection	Exceeding the parameter set value and set time (>65°C, 2s)
Insulation level 1	Exceeding the parameter set value and set time
Insulation level 2	Exceeding the parameter set value and set time
Heating film overtemperature alarm	Exceeding the parameter set value and set time (>75°C, 2s)
Heating film overtemperature protection	Exceeding the parameter set value and set time (>80°C, 2s)
BMS connector overtemperature alarm	Exceeding the parameter set value and set time
BMS connector overtemperature protection	Exceeding the parameter set value and set time
BMU connector overtemperature alarm	Exceeding the parameter set value and set time
BMU connector overtemperature protection	Exceeding the parameter set value and set time
Power loop overtemperature alarm	Exceeding the parameter set value and set time
Power loop overtemperature protection	Exceeding the parameter set value and set time
SOC too low	Exceeding the parameter set value and set time
Total voltage too high alarm	Exceeding the parameter set value and set time
Total voltage too high protection	Exceeding the parameter set value and set time
Total voltage too low alarm	Exceeding the parameter set value and set time
Total voltage too low protection	Exceeding the parameter set value and set time
Discharge relay adhesion	Relay feedback information state adhesion
Charge relay adhesion	Relay feedback information state adhesion
Heating relay adhesion	High voltage is detected after disconnecting the heating relay
Limit protection	Exceeding the parameter set value and set time
Abnormal power supply voltage	Exceeding the parameter set value and set time
Master positive relay adhesion	Relay feedback information state adhesion
Fuse Blown	No high voltage is detected after the loop relay is closed
Repeated BMU address fault	BMU with the same number
INTER-CAN BUS communication failure	Loss of communication between BMS
PCS-CAN BUS communication failure	The heartbeat message of the inverter is not received for a long time
RS485 communication failure	Inverter RS485 access is not received for a long time
Abnormal RS485 communication	C
External total voltage acquisition fault	/
Internal total voltage acquisition fault	The difference between the acquired internal total voltage and the accumulated internal total voltage exceeding the set value
SCHG total voltage acquisition fault	/
Cell voltage acquisition fault	The cell voltage acquired is 0
Temperature acquisition fault	The temperature acquired is -40 °C
Current acquisition fault	/
Current module fault	Abnormal Hall current/reference voltage
EEPROM storage failure	EEPROM write failure during self-set
RTC clock fault	The external RTC failed to enable the charging function

Fault Types	Trigger Conditions
Pre-charge failure	Pre-charge timeout
Charging voltage too low	The minimum cell voltage is lower than the set value
BMU lost	
Abnormal number of BMU	The number of BMU address is different from the number of set parameters

SUNSYNK-W SCREEN DISPLAY LOGIC

1. After startup, the screen is on for 20 seconds and then off. Each time the touch screen is lit behind the scenes for 20 seconds, and then turned off until the next touch.
2. The first 2s of boot, the screen shows all.
3. The fault code starts from F001 in ascending order.
4. Each fault is displayed for 5s, and then switch to the next fault.
5. If all faults are rectified, keep the previous fault on the screen for 5 seconds and clear the screen.

For more informatoin contact us.

Fault Code	Fault Displayed	Description
F001	ALARM_ID_SUM_OVER_VOLT_LEV_2	Excessive total pressure
F002	ALARM_ID_SUM_LOW_VOLT_LEV_2	The total pressure is too low
F003	ALARM_ID_CHG_OVER_TEMP_LEV_2	Charging temperature is too high
F004	ALARM_ID_DSG_OVER_TEMP_LEV_2	High discharge temperature
F005	ALARM_ID_CHG_LOW_TEMP_LEV_2	The charging temperature is too low
F006	ALARM_ID_DSG_LOW_TEMP_LEV_2	The discharge temperature is too low
F007	ALARM_ID_OVER_DIFF_VOLT_LEV_2	Excessive differential pressure
F008	ALARM_ID_OVER_DIFF_TEMP_LEV_2	Excessive temperature differentials
F009	ALARM_ID_CELL_OVER_VOLT_LEV_2	Cell overvoltage
F010	ALARM_ID_CELL_LOW_VOLT_LEV_2	Cell undervoltage
F011	ALARM_ID_PRE_CHG_RES_OVER_TEMP_LEV_2	The temperature of the precharge resistance is too high
F012	ALARM_ID_NORTH_CONNECTOR_OVER_TEMP_LEV_2	The temperature of the BMS connector is too high
F013	ALARM_ID_SOUTH_CONNECTOR_OVER_TEMP_LEV_2	The BMU connector temperature is too high
F014	ALARM_ID_CHG_OVER_CUR_LEV_2	Charging current fault
F015	ALARM_ID_DSG_OVER_CUR_LEV_2	Discharge current fault
F016	ALARM_ID_SOC_OVER_LEV_2	High SOC fault
F017	ALARM_ID_INSULATION_FAILURE_TWO	Insulation fault
F018	ALARM_ID_HEAT_OVER_TEMP_LEV_2	The heating film is too high
F019	ALARM_ID_SOC_LOW_LEV_2	The SOC is too low
F020	ALARM_ID_DSG_RELAY_ADHESION	The total voltage is too low
F021	ALARM_ID_POS_RELAY_ADHESION	Total positive relay bonding
F022	ALARM_ID_CHG_RELAY_ADHESION	The charging relay is glued
F023	ALARM_ID_HEAT_RELAY_ADHESION	The heating relay is glued
F024	ALARM_ID_ULTIMATE_PROTECTION	Ultimate protection
F025	ALARM_ID_POWER_SUPPLY_FAULT	Abnormal supply voltage

Fault Code	Fault Displayed	Description
F026	ALARM_ID_FUSE_BLOWN	Blown fuse
F027	ALARM_ID_BMU_ADDR_REPEAT	The BMU repeatedly fails
F028	ALARM_ID_BMS_ADDR_REPEAT	The BMS is faulty repeatedly
F029	ALARM_ID_INTERNAL_COMM_ERROR	The internal CAN communication fails
F030	ALARM_ID_PCS_CAN_COMM_FAIL	The PCS CAN communication fails
F031	MBMS_SAM_SIG_ID_PCS_ERROR_STATE	The PCS RS485 communication fail
F032	ALARM_ID_PCS_RS485_COMM_ERROR	The PCS RS485 communication is abnormal
F033	ALARM_ID_FUSE_VOLT_SAMP_ERROR	The FUSE total pressure collection is abnormal
F034	ALARM_ID_BAT_VOLT_SAMP_ERROR	Abnormal internal total pressure collection
F035	ALARM_ID_MOT_VOLT_SAMP_ERROR	The Mot total pressure collection is abnormal
F036	ALARM_ID_HTP_VOLT_SAMP_ERROR	The heating total pressure collection is abnormal
F037	ALARM_ID_CELL_VOLT_SAMPLE_ERROR	Voltage collection fault
F038	ALARM_ID_TEMP_SAMPLE_ERROR	Temperature acquisition fault
F039	ALARM_ID_CURRENT_SAMPLE_ERROR	Current acquisition fault
F040	ALARM_ID_CURRENT_MODULE_FAULT	Current module fault
F041	ALARM_ID_POS_RELAY_DRIVE_FAULT	Total positive relay drive failure
F042	ALARM_ID_CHG_RELAY_DRIVE_FAULT	Charging relay drive failure
F043	ALARM_ID_DSG_RELAY_DRIVE_FAULT	Discharge relay drive failure
F044	ALARM_ID_HEAT_RELAY_DRIVE_FAULT	Heating relay drive failure
F045	ALARM_ID_EEPROM_ERROR	The EEPROM storage is faulty
F046	ALARM_ID_PRECHARGE_ERROR	The precharge failed
F047	ALARM_ID_CHG_VOLT_LOW	The charging voltage is too low
F048	ALARM_ID_BMU_COMM_ERROR	The BMU communication is faulty
F049	ALARM_ID_BMU_NUMBER_ERROR	The number of BMUs is abnormal
F050	ALARM_ID_MBMS_NTC_BREAKLINE_ERROR	Temperature collection of the BMS connector is abnormal
F051	ALARM_ID_BMU_NTC_BREAKLINE_ERROR	The temperature collection of the BMU connector is abnormal
F052	ALARM_ID_PACK_THERMAL_RUNAWAY	PACK thermal runaway fault
F053	ALARM_ID_PACK_FIRE_FAULT	PACK fire failure
F054	ALARM_ID_TCP_CONNECT_FAIL	TCP connection failure
F055	ALARM_ID_W5500_SPI_COMM_FAIL	The W5500SPI communication fails
F056	ALARM_ID_LC_COMM_LOST	LC communication loss
F057	ALARM_ID_PACK_AFE_COMM_ERROR,	BMU AFE communication fails
F058	ALARM_ID_BLE_INIT_FAULT	Description Bluetooth initialization failed
F059	ALARM_ID_CELL_TYPE_MISMATCH_ERROR	The battery type does not match

MAINTENANCE AND UPGRADE



CAUTION

- Improper decommissioning may cause damage to the equipment and/or battery inverter.
- Before maintenance, ensure that SUNSYNK-W is decommissioned according to relevant provisions.

PLEASE NOTE

All maintenance work shall comply with local applicable regulations and standards. The USB disk port of SUNSYNK-W has the functions of upgrading firmware and recording battery data, which can be used as an auxiliary tool.

SUNSYNK-W Maintenance

To ensure safe operation, all plug connections must be checked. If necessary, relevant operators shall press them back into place at least once a year.

The following inspection or maintenance must be carried out once a year:

- General visual inspection.
- Check all tightened electrical connections. Check the tightening torque according to the values in the following table. Loose connections must be retightened to the specified torque.

Connection Mode	Tightening Torque
High-voltage control box grounding	5Nm
Fixing the lug of the high-voltage control box	1.5Nm
Fixing the lug of the battery module	1.5Nm

- Using the monitoring software, check whether the SoC, SOH, battery voltage and temperature of the battery module are abnormal.
- Shut down and restart SUNSYNK-W once a year.

PLEASE NOTE

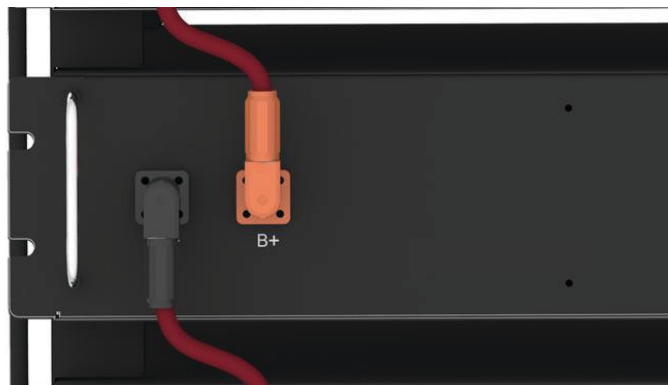
- If the system is installed in a polluted environment, maintenance and cleaning must be carried out at short intervals.
- Clean the battery rack with a dry-cleaning cloth. Ensure that no moisture comes into contact with the battery connections. Do not use solvents.

USB's Upgrade Step

1. USB type: USB2.0, FAT32;
2. Create the upgrade folder according to the directory;
3. Place the upgrade file provided by the supplier in the upgrade folder;
4. Turn on the battery, and insert the USB flash disk after the blue indicator is on;

5. After the blue light indicator flashes and turns off, pull out the USB flash disk to complete the upgrade. Do not turn off the battery during the process.
6. After the blue light indicator of the battery lights up again, check the version number through the screen or app and verify the upgrade result.

BATTERY MODULE STORAGE



1. To ensure the battery service life, the storage temperature shall be kept between 0°C~35°C. The battery shall be cycled at least once every 6 months.
2. To minimize self-discharge in a long storage period, disconnect the BATTERY connection (1/2) of the high-voltage control box of the DC connecting cable. This will interrupt the use of the 12 V power supply installed in the high-voltage control box and prevent the battery from self-discharging.

DISPOSAL

For details related to the disposal of battery modules, please contact us. Tel: +852 2884 4318 / Email: support@sunsynk.com / sales@sunsynk.com For more information, please visit www.sunsynk.com.

Observe applicable regulations on waste battery disposal. Immediately stop the use of damaged batteries. Please contact your installer or sales partner before disposal. Ensure that the battery is not exposed to moisture or direct sunlight.



CAUTION

1. Do not dispose of batteries and rechargeable batteries as domestic waste! You are legally obliged to return used batteries and rechargeable batteries.
2. Waste batteries may contain pollutants that can damage the environment or your health if improperly stored or handled.
3. Batteries also contain iron, lithium and other important raw materials, which can be recycled.

For more information, please visit www.sunsynk.com. Do not dispose of batteries as household waste!





Contact Us

Call +44 151 832 4300 **Email** sales@sunsynk.com **Website** www.sunsynk.com

Address

- HK** Room 702-704, 7/F Texwood Plaza, 6 How Ming Street, Kwun Tong, Kowloon, Hong Kong
- UK** Sunsynk UK Ltd, 17 Turnstone Business Park, Mulberry Avenue, Widnes, Cheshire, WA8 0WN
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- NL** Sunsynk NL BV, Henri Wijnmalenweg 8, 5657 EP Eindhoven, Netherlands
- AU** Level 1, 982-988 Wellington Street, West Perth WA 6005, Australia
- ES** Tafetana, 32 P.I. Las Andoriñas 38639 Las Chafiras Santa Cruz de Tenerife
- US** 100 S. Ashley Drive, Suite 600, Tampa, Florida, 33602, United States of America