

AW7500(WM5000)

Lithium Battery

USER MANUAL



Content

Purpose	
Scope	1
Disposal	1
Target Group	1
Disclaimer	1
Safety Instructions	2
Preface	3
1 Introduction	4
1.1 Brief Introduction	4
1.2 Product Features	4
2 Product Specification	4
2.1 Size and Weight	4
2.2 Parameters	5
2.3 Interface Setting	
2.3.1 DIP Switch Definition and Description	
2.4 Battery Management System(BMS)	
2.4.1 Voltage Protection	
2.4.2 Current Protection	
2.4.3 Storage, Maintenance and Expansion	
2.4.4 Temperature Protection	
2.4.5 Other Protection	
3 Installation and Configuration	
3.1 Ready for installation	.10
3.1.1 Environmental requirements	
3.1.2 Tools and data	
3.1.3 Technical preparation	
3.1.4 Unpacking inspection	
3.1.5 Engineering coordination	
3.2 Equipment installation	
3.2.1 Installation preparation	
3.2.2 Electrical installation	
3.3 Batteries Connecting Illustration	
4 Use, maintenance and troubleshooting	
4.1 Batteries system usage and operation instructions	
4.2 Alarm description and processing	
5 Communication with inverter brands	
6 Packing List	
7 Installation Instructions	.23



Purpose

This manual describes the assembly, installation, operation and troubleshooting of the unit. Please read this manual carefully before installation and operation. Keep this manual for future reference.

Scope

This manual provides safety and installation instructions as well as information on tools and wiring.

Disposal

The storage, use and disposal of the products shall be carried out in accordance with the product manual, relevant contract or local environmental laws and regulations.

Target Group

This document is intended for qualified individuals; however procedures that do not require qualification may be performed by end users.

A qualified person requires having the relevant know-how and experience in the operation and installation of lithium batteries and electrical devices (in particular inverters). Additionally, has knowledge of the applicable standards and safety procedures related to the aforementioned installations.

Disclaimer

Before using this product, please carefully read this manual, especially safety instructions, warning information, terms of use, and disclaimers. Users are responsible for any losses caused by their failure to use this product in accordance with this user manual.

In compliance with laws and regulations, the final interpretation rights of this document and all related documents of this product belong to the company.

No further notifications will be given in case of any update, revision or termination.



Safety Instructions

General Safety Precautions

Read and Understand: Before using the AW7500(WM5000) battery, read and und erstand allsafetyinstructions and warnings.

Qualified Personnel: Installation should be performed by qualified personnel only.

Personal Protective Equipment (PPE): Always wear appropriate PPE, including safety goggles, gloves, and protective clothing.

Fire Safety: Keep a fire extinguisher rated for electrical fires nearby. Do not use water to extinguish a battery fire.

No Smoking or Open Flames: Do not smoke or use open flames near the battery system.

Electrical Safety

Power Off: Ensure the battery system is powered off and disconnected from all electrical sources before performing any installation or maintenance.

Short Circuit Prevention: Avoid short circuits by ensuring that tools and other conductive materials do not come into contact with the battery terminals.

Voltage Awareness: Be aware of the battery voltage and take appropriate precautions to avoid electric shock.

Insulation: Use insulated tools and wear rubber gloves when working with the battery. Handling and Storage.

Handling and Storage

Handling: Handle batteries with care. Avoid dropping or applying excessive force, which can cause physical damage and potential safety hazards.

Ventilation: Ensure that batteries are stored in a well-ventilated area to prevent the buildup of gases. Place the batteries at least 10 cm apart to allow for proper ventilation and ease of installation.

Storage Temperature: Store the battery in a dry, cool place away from direct sunlight. The recommended storage temperature is between -20°C and 45°C.

Charge State: Charge the battery to approximately 50% before storing it for extended periods. Recharge every six months to maintain battery health.

Avoid Water Exposure: Do not expose the battery to water or high humidity environments.

Preventive Measures: Ensure that the battery is stored away from flammable materials and sources of heat.



Emergency Procedures

Leakage: In case of electrolyte leakage, avoid contact with the skin or eyes. If contact occurs, rinse immediately with plenty of water and seek medical attention.

Damaged Batteries: Do not use or attempt to repair damaged batteries. Contact the manufacturer or a qualified service technician for assistance.

Fire Response: In the event of a fire, use a Class D or ABC fire extinguisher. Evacuate the area and contact emergency services.

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Preface

Manual Declaration

The AW7500 lithium iron phosphate battery energy storage system can provide energy storage solutions for photovoltaic power generation users through parallel combination. This user manual details the basic structure parameters, basic procedures and methods of installation and operation, maintenance of the equipment.



1 Introduction

1.1 Brief Introduction

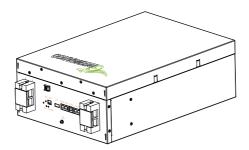
The AW7500(WM5000) Lithium Batteries are energy storage devices which are in tended for the use in backup power and solar energy solutions.

1.2 Product Features:

- The AW7500 Lithium Batteries offer high performance with 100A discharge current.
- The batteries are manufactured with high quality lithium iron phosphate (LiFePO4) cells for extended life cycle.
- The batteries' cells are managed by the latest Battery Management System (BMS) for improved performance and protection against over-discharge / charge / current and high/low temperature.
- Our products comply with European ROHS standards, are SGS Certified and are composed of nontoxic environment-friendly materials.
- The batteries are stackable (Maximum of 15 units) for use in large energy storage solutions.
- The batteries offer a high depth of discharge (DOD) and low cut off voltage for maximum use.

2 Prodcut Specification

2.1 Size and Weight



Batteries size:~566mm*366mm*175.4mm

Batteries weight: ~48kg



2.2 Parameters

SPECIFICATIONS	
MODEL	AW7500(WM5000)
Rated Power	5000W
Parallel Capability	Up to 15 units
Basic parameter	
Rated Voltage	51.2V
Nominal Capacity	4945Wh
PHYSICAL	
Dimension, W x D x H	566*366*175.4mm
Net Weight	about 48kg
Communication Interface	RS232/RS485/CAN
Electrical Parameter	
Charge Mode	CC/CV/CP
Max. Charge Current 1)	50A
Charge Cut-off Voltage	58.4V
Diacharge Mode	CC/CP
Discharge Cut-off Voltage	44.8V
Max. Discharge Current 2)	100A
Peak Discharge Current 3)	350A(100ms)
ENVIRONMENT	
Humidity	5% to 95% RH
Operating Temperature	Charging: 0~+50°C/Discharging: -20~+55°C
Storage Temperature	-20~+45°C(three months) / -20~+25°C (one year)
Shipment Status	Voltage: 52V~54V SOC: 60%~80%
Warranty	

10 years warranty, >6000 cycles life

Notes:

1)For better battery life cycles, we suggest charge in 48A(0.5C @25°C)

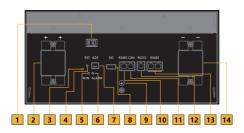
2)For better battery life cycles, we suggest discharge in 48A(0.5C @25°C)

3)Peak Current excludes repeated short duration (less than 100ms) of current pattern.



2.3 Interface Setting

This section details the front interface of the battery.



Item	Name	Definition
1	Power switch	ON/OFF, must be in the "ON" position when using
2	Positive terminal	Battery output positive or parallel positive line
3	ON/OFF light	Instructions are shown in 4.2
4	Reset	Press this button may awake the battery when the power switch is "ON"
5	Run	Instructions are shown in 4.2
6	ALM	Instructions are shown in 4.2
7	ADS	DIP switch
8	DO	Dry Contact
9	Ground	Shell grounding connection
10	RS485	RS485, communication
11	CAN	CAN Communication between Batteries and inverters
12	RS232	RS232 Communication
13	RS485	RS485, communication between batteries
14	Negative terminal	Battery output negative or parallel negative line



2.3.1 DIP Switch Definition and Description

Set the master battery dip switch 1 to the ON position (up), for the first slave battery set dip switch 2 ON, for the second slave battery set dip switch one and two to ON, for the third battery set dip switch 3 to ON (see illustration below).









No.1

No.2

No.3

No.4

Address	Position of the dial code switch			
	#1	#2	#3	#4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Table 2-1

Maximum of 15 batteries in parallel are supported, and the address code for each battery must be different.



2.4 Batteries Management System(BMS)

2.4.1 Voltage Protection

Low-voltage protection

The battery will disconnect when low-voltage cut off is reached and will recover once it is recharged to reach the required voltage.

Over-voltage protection

The battery will stop charging when max-voltage cut off value is reached, charging will resume once the voltage goes under the setting value.

2.4.2 Current Protection

Over-current charge protection

The battery will stop charging when current exceed the maximum allowed current, charging will resume once the voltage goes under the setting value.

Over-current discharge protection

When the discharge current is larger than the protection value, the battery will stop discharging. Protection will be released after rated delay time.

2.4.3 Storage, Maintenance and Expansion

Charge the battery at least once every six months during storage, and ensure the charging amount does not exceed 80% of the rated capacity.

Every year after installation. The connection of power connector, grounding point, power cable and screw are suggested to be checked. Check for any signs of wear or damage and contact a qualified technician if any issues are found.

Make sure there is no loose, no broken, no corrosion at connection point. Check the installation environment such as dust, water, insect etc. make sure it is suitable for IP20 battery system.

A new battery module can be added onto an existing system at any time. Please make sure the new battery is acting as the master. The new module, due to a higher SOH may have a difference on SOC with existing system, but it will not affect the parallel connection system performance.



2.4.3 Temperature Protection

Under/Over temperature protection in charging

When the temperature of the battery is beyond range of 0° C ~+50°C during charging, temperature protection will be triggered and the battery will stop charging. Protection will be released when the temperature returns to the set range.

Under/Over temperature protection in discharging

The working temperature of the battery is between -20°C and 55°C, the batteries will be disconnected if these values are exceeded. The battery will resume operation once temperature reaches the allowed values.

2.4.4 Other Protection

Short Circuit Protection

When there is a short circuit situation happens, the short-circuit protection will be triggered. After removing the load or connecting the charging source, the protection will be released.

Self - Shutdown

The device will dormant automatically if there are no external loads and power supply or no external communication for over 24 hours.



3 Installation and Configuration

3.1 Ready for installation

Safety Requirement

This system can only be installed by personnel who have been trained in the power supply system and have sufficient knowledge of the power system.

The safety regulations and local safety regulations listed below should always be followed during the installation.

- All-circuits connected to this power system with an external voltage of less than 48V must meet the SELV requirements defined in the IEC60950 standard.
- Only use equipment that are compatible with the batteries i.e. 48 volts inverters and inverters which are compatible with lithium batteries.
- Use suitable cable for the expected load current.
- Sufficient space is available for the batteries.
- Sufficient ventilation to prevent batteries and other equipments from overheating.
- Use adequate personal protective equipment (PPE) when installing batteries.
- If a battery cabinet or rack is used, make sure it is installed correctly and can carry the batteries weight.
- The power line specification shall meet the requirements of maximum discharge current for each product.

3.1.1 Environmental requirements

Indoor Installation: Install the system indoors, avoiding direct sunlight, wind, conductive dust, and corrosive gases.

Ventilation: Ensureadequate airflow around the battery to prevent overheating. Maintain at least 10 cm space around each battery unit.

Temperature Range: Operating temperature should be -20°C to +55°C.

Charging temperature range is 0°C~+50°C,

Discharging temperature range is -20°C ~+55°C.

Storage temperature should be -20°C to +25°C (<1 year) or -20°C to +45°C (<3 mont hs).

Humidity: Maintain relative humidity between 5% and 95% RH.

Elevation: Do not exceed 4000m above sea level.

Avoidance of Hazards: Keep away from flammable, explosive materials.



Optimal Conditions: Aim for an ambient temperature of 15°C to 30°C.

Installation Space: Ensure the ground is flat and level, and there is sufficient space for installation.

Proximity to Sea: Avoid installation locations close to the sea to prevent exposure t o brine and high humidity.

3.1.2 Tools and data

Tools and meters that may be used are shown in table 3-1.

Table 3-1 Tools/Instuments

Name	
Screwdriver	AVO meter
Wrench	Clamp meter
Inclined pliers	Insulating tape
Needle nose pliers	The thermometer
Clip forceps	Wrist strap
Wire stripper	Таре
Electric drill	

3.1.3 Technical preparation

Devices that connected directly to the batteries can be user equipments, power supplies, and other power supply equipments.

Please check if the user's PV power generation equipment, power supply or other power
supply equipment has a DC output interface, and the voltage meets the requirements of the inverter.

Check the maximum discharge current capability of the DC power interface of the user's photovoltaic power generation equipment, power supply or other power supply equipment, it should be greater than the maximum charging current of the products.



3.1.4 Unpacking inspection

- Firefighting equipment should be provided near the equipment, such as portable dry powder fire extinguisher.
- No flammable, explosive and other dangerous articles are placed beside the batteries.
- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to direct sunlight and rain.
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package with for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.
- After opening the packaging, the technical documents should be read, and the list should be verified according to the configuration table and packing list to ensure that the item is intact and undamaged. If the internal packaging is damaged, it needs to be inspected and recorded.

3.1.5 Engineering coordination

The following precautions should be taken before construction.

- Power cord:
 - The power cord should meet the maximum discharge current requirements of each product.
- Installation space and rack capacity:
 Make sure that the battery has enough room to install, and the batteries rack and bracket have enough load capacity.
- Ensure that the power cord and grounding wire are reasonable. Not prone to short circuits, water ingress, and corrosion.



3.2 Equipment installation

Table 3-2 Installation steps

		stallation steps
Step 1	Installation Preparation	Confirm that the power switch on the front panel of AW7500(WM5000)
Step 2	Mechanical Installation	Please refer to Part 7 "Installation Instructions"
		1.Ground wire installation
		2.Battery module parallel cable installation
Step 3	Electrical Installation	3.Battery module total positive cable installation
		4.Battery module total negative cable installtion
		5.Internal RS485 communication interface connection
		1.Press the power switch to the "ON" position
Step 4	Battery System Self-test	2.BMS system power on activation Check RUN and ALM LED according to 4.2 Alrmdescription and processing. Note 1
		3.Check the system output voltage
		4.Shut down the system
Circuit breaker		1.Connect total positive & total negative cables of the battery to circuit breaker input.
Step 5	Installation	2.Turn on the battery switch, turn the circuit breaker switch to the closed state, and use a multimeter to test whether the output voltage of the circuit breaker is normal. Then turn off the battery and circuit breaker.
Step 6	Inverter connection	1.Connect positive & negative cables of the Inverter to circuit breaker output. 2.Connect the CAN communication port of the battery and the EMS communication port of the inverter through the network cable.

^{*}Note 1: In standby mode, Check if RUN LED is flash (Flash1) and ALM LED is OFF (Standby Mode) or Flash3 (Cell under Voltage)



3.2.1 Installation preparation

Prepare equipment and tools for installation Check if the power switch of the battery unit is in the "OFF" position to ensure there is no live operation.

3.2.2 Flectrical installation

- Before connecting the power cables, use a multimeter to measure cable continuity, short circuit, confirm positive and negative, and accurately mark the cables.
- Cable availability: select a buzzer and use a probe to measure the ends of the same color cable. If the buzzer sounds, it indicates that the cable is available.
- After checking the appearance of the power cord connection, the positive and negative poles of the battery shall be connected respectively to the positive and negative poles of the opposite terminal.
- Add a DC circuit breaker between the inverter and the battery. This DC circuit breaker model of Nader brand can be selected is NDB1C-125C, the parameter is DC80V/125A (2P), and a DC circuit breaker can also be purchased locally by the installer. The selection of the circuit breaker requires:

Voltage:U> 60V

Current: $I = \frac{Inverter\ power}{45V}$

3.3 Battery Connecting Illustration

- 3.3.1 The 6AWG wires included in the packaging of the AW7500(WM5000) can support a maximum current of 100A. Therefore, when the inverters are connected in parallel and the output power of the inverters exceeds 5kW, additional mainlines may be required.
- 3.3.2 Taking inverters with output power of 10kW, 15kW, and 20kW as an example:
 - a) When two 5kW inverters are combined in parallel, the total output of the batteries will be 10kW, so the main wire will take 200A current at most. If a 6AWG wire is used to transmit 200A current, there is a risk of serious heating and even component failure. Therefore, it is suggested to use wires as designed in the schematics.

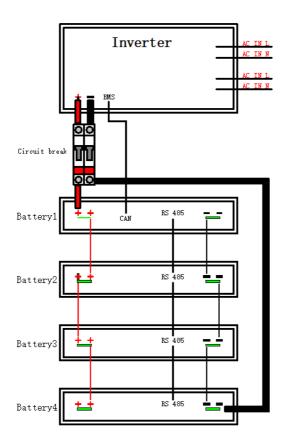
When batteries are connected in parallel, the current between batteries will not exceed 100A, and the cables included in the package can be used for the connection between batteries.

The two inverters communicate with the host battery 1# through the hub, as the schematic shows.



b) The wiring of 15kW and 20kW output power of the inverter are similar with 10kW.

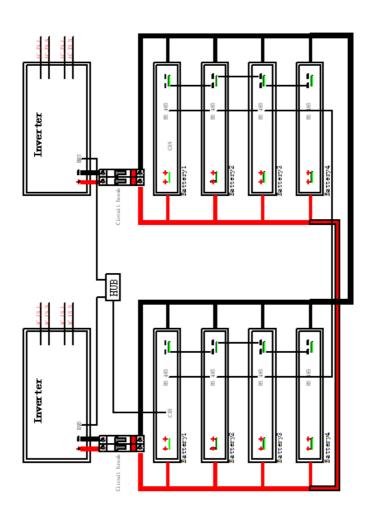
Note: the red wire represents the main line of positive electrode, the positive electrode of a single battery (purple wire) should be connected directly to the main wire; and the black wire represents the main wire of negative electrode, the negative electrode of a single battery should be connected directly to the main wire.



Single Inverter

^{*}Busbar Connection Recommended

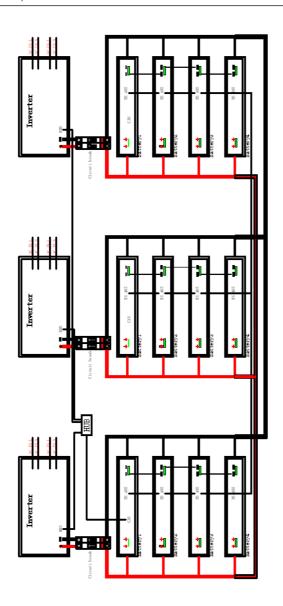




Two Inverters in Parallel

^{*}Busbar Connection Recommended

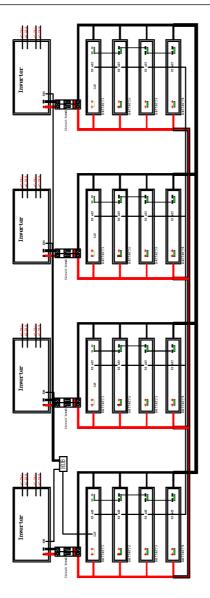




Three Inverters in Parallel

*Busbar Connection Recommended



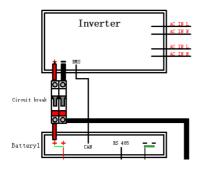


Four Inverters in Parallel

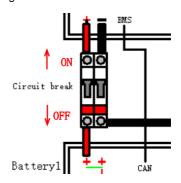
^{*}Busbar Connection Recommended



The circuit breaker is installed between the batteries module and the inverter, as shown in Figure.



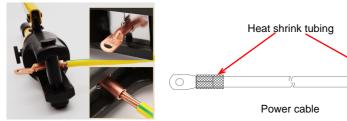
When the battery system needs to manually turn on and off the connection between the battery and the inverter without the help of any tools, you can switch the circuit breaker to ON or OFF according to the red arrow direction in the figure below.



Manufacturing Cables When Required

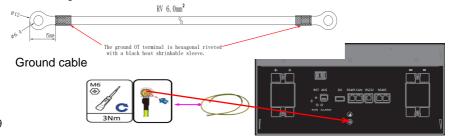
1, Power Cable

Cable: 25mm²/UL3512/red and black OT terminal: OT25-8 Copper Use hydraulic terminal pliers for crimping, refer to the image below. Heat shrink tubing is required in the terminal crimping area.



2, Ground cable

Cable: RV 6mm² Yellow-green cable OT terminal: OT6-6 Copper The installer can process the length of the ground cable according to the need s of the site. Refer to the schematic diagram below for the crimping and install ation of the ground OT terminal.



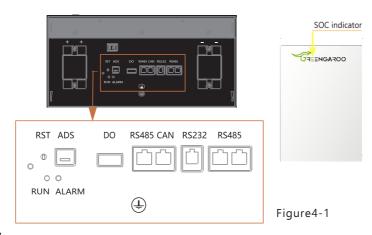


4 Use, maintenance and troubleshooting

4.1 Battery system usage and operation instructions

After completing the electrical installation, follow these steps to start the battery system.

- 4.1.1 Refer to the description of the DIP switch of 2.3.1 to prepare the batteries module before starting up, then press the ON/OFF button to the ON position. The circuit breaker switch is turned into a closed state.
- 4.1.2 After the indicator self-test, the RUN indicator will light and the SOC indicator will be on (100% SOC status in Figure 4-1).





- 1.After pressing the power button, if the battery status indicator on the front panel continues to be red, please refer to the "4.2 Alarm description and processing". If the failure cannot be eliminated, please contact the dealer timely.
- 2.Use a voltmeter to measure whether the voltage of the battery access terminal of the circuit breaker is greater than 42V, and check whether its polarity is consistent with the inverter input polarity. If the battery access terminal of the circuit breaker has a voltage output and is greater than 42V, the battery can function normally.
- 3.After confirming that the output voltage and the polarity of the battery are correct, turn on the inverter, close the circuit breaker.
- 4. Check if the indicator of the inverter and battery connection (communication indicator and battery access status indicator) is normal. If it's normal, the connection between the battery and inverter is successfully completed. If the indicator light is abnormal, please refer to the inverter manual for the cause or contact the dealer.



4.2 Alarm description and processing

LED instructions

State	Normal/ Alarm/	ON/ OFF	RUN	ALM	Power Indicator LED	Instructions
	Protection	OFF	•	•		
Shutdown	Sleep	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	ON	Flash1	OFF	According to the gas gauging	Standby mode
Stariaby	Alarm	ON	Flash1	Flash3	Red Flash3	Cell under Voltage
Charge	Normal	ON	ON	OFF	SOC: 0~26%, Red Flash 1, Red Flash2; SOC: 26%~51%, Yellow Flash 1, Yellow Flash2; SOC: 51%~76%, Blue Flash 1, Blue Flash2; SOC: 76%~96%, Green Flash 1, Green Flash2; SOC: 96%~100%, Green ON;	Charge mode
	Alarm	ON	ON	Flash3	Red Flash3	
	OVP	ON	ON	OFF	ON	Switch to standby when there are no electric supply
	Temp/occ/ failure	ON	OFF	ON	OFF	Stop charging
	Normal	ON	Flash3	OFF	SOC: 75%~100%, Green ON; SOC: 50%~75%, Blue ON; SOC: 25%~50%, Yellow ON; SOC: 10%~25%, Red ON; SOC: 0~10%, Red Flash 1, Red Flash2;	Discharge mode
Discharge	Alarm	ON	Flash3	Flash3	Red Flash3	
	UVP	ON	OFF	OFF	OFF	Stop discharging
	Temp/ ocd/ascd/ failure	ON	OFF	ON	OFF	Stop discharging
Failure		OFF	OFF	ON	Red Flash3	Stop charging/ discharging



Routine maintenance

When the battery system is running for a long time, it is recommended that users do the following maintenance operations:

Check content	Maintenance method	Maintenance cycle
System cleaning	Check whether the appearance of the	Once every six
System cleaning	system is damaged or deformed.	months to oncea year.
	Clean the system.	
System running	Check whether there is abnormal sound during the	Once overvisiv menths
state	operation of the system.	Once every six months
	Check whether indicator lights work normally.	
	Check whether the system parameters arenormal.	
	Check whether the cable connection isloose.	11-15
	Check whether the cables are discolored.	Half a year after the
Electrical	Check whether the cable is damaged, especially	firstcommissioning,an
connection	whether there is a cut mark on thesurface of the	d onceevery half a
	cable in contact with the metalsurface	year to a
Ground reliability	Check whether the ground cable is groundedreliably	yearthereafter.

5. Communicable inverter brands and models

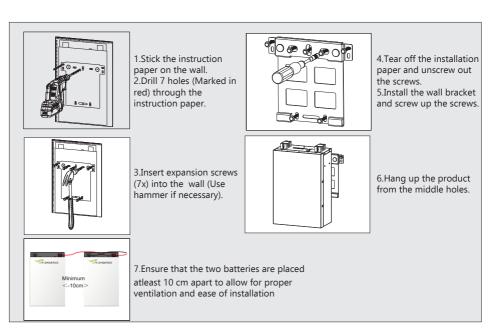
Brand	model
Solis	S6-EA1P3.6K-L,S6-EA1P4.6K-L,S6-EA1P5K-L,S6-EA1P6K-L
DEYE	SUN-3K-SG04LP1-AU,SUN-3.6K-SG04LP1-AU,SUN-5K-
DETE	SG04LP1-AU,SUN-6K-SG04LP1-AU,SUN-7.6K-SG04LP1-AU
SUNGROW	SPA-3000TL-BL-UP,SPH-3000~6000TTL-BL-UP
SMA	SUNNY ISLAND 4.4M/6.0H/8.0H
Sunsynk	SUNSYNK-3.6K-SG03LP1-AU,SUNSYNK-5K-SG03LP1-AU
Lux Power	LXP3/3.6/4/4.6/5/6K



6 Packing List

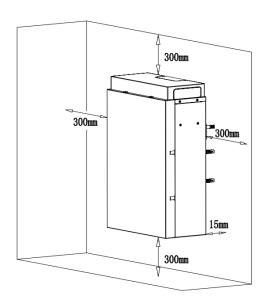
No.	Item	Quantity(pcs)	Note
1	Battery AW7500(WM5000)	1	51.2V 96.6Ah
2 (ommunication cable - to inverter	0	Optional
3	Positive cable - to inverter	0	Optional
4	Negative Cable - to inverter	0	Optional
5	Parallel cable - positive	1	
6	Parallel cable - negative	1	
7	Communication parallel cable	1	
8	Ground Wire	1	
9	User Manual	1	_

7.1 Installation Instructions





7.2 Installation clearance



Make Sure to leave a space of at 15mm between the pack and the wall. Make sure that the battery pack is not less than 300mm away from other directions when installed on the wall.

Note

Make sure that the Battery Pack is always exposed to the ambient air. The battery pack is cooled by natural convection. If the battery pack is entirely or partially covered or shieled, it may cause the battery pack to stop operating.



8. Storage, Maintenance and Expansion

Charge the battery at least once every six months during storage, and ensure the charging amount does not exceed 80% of the rated capacity.

Every year after installation. The connection of power connector, grounding point, power cable and screw are suggested to be checked. Check for any signs of wear or damage and contact a qualified technician if any issues are found. Make sure there is no loose, no broken, no corrosion at connection point. Check the installation environment such as dust, water, insect etc. make sure it is suitable for IP20 battery system.

A new battery module can be added onto an existing system at any time. Please make sure the new battery is acting as the master. The new module, due to a hig her SOH may have a difference on SOC with existing system, but it will not affect the parallel connection system performance.

Interface setting and DIP switch Definition and Description, please refer to 2.3 & 2.3.1

^{*}Product can be hanged up either horitonally or vertically.



Warranty Claim Form

Note: Signature or Seal stamp required. Please print it, sign or stamp and then email to Distributor. Distributor shall have no obligation for unqualified application such as incorrect information or missing necessary information.

Product Model	SerialNumber(S/N)
Company Name	
Contact Person	Contact Number
Contact Email	
Company Address	
Name of End user	
Date of Installation	
Installation Location (indoors)	

Fault Description

Can the battery start up	Communication is normal	LED status (Quantity and color)

Warranty Claim Authorized Signature:

The following information must provide after faulty battery been replaced Replacement Information

Replaced by		Replace Date	
Replacement Information Authorized signature:			
Contact Distributor :			
Distributor Name: (With stamp for confirmation)			
Contact Email:			
Telephone #:			

