

# HOME ENERGY STORAGE SYSTEM

# Model: WY51100 \_\_\_\_





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## 1. Instructions for Use

Please read all instructions and precautions in the manual carefully before installation and use.

## 1.1 Usage Guidelines

- This product should be used in accordance with local standards, laws and regulations, and any behavior that does not meet the requirements of use may cause personal injurylnjuries and property damage.
- The drawings provided in this manual are used to explain the concepts associated with this product, including product information, installation guides, electrical connections, system debugging, safety information, frequently asked questions and maintenance.
- Do not change any internal parameters without permission. Anything without authorized settings changes will void the warranty.

AC	Alternating current
DC	Direct current
PV	Solar power
BMS	Battery management system
PCS	Power conversion system
RJ45	Standard socket 45
State of Battery Charge	Charge state
С	Charge and discharge ratio
RS485	RS485 communication interface
CAN	Controller LAN

#### **1.2 Definition of Abbreviations**



# 2. Safety Precautions

## 2.1 Security Symbols

This device contains the following symbols, please pay attention to identify.

Symbol	Description
	Comply with the attached documents
Â	Danger There's a risk of electrocution!
<u>A</u>	High pressure is dangerous High pressure in energy storage systems can be life-threatening
<u></u>	Hot surface
CE	CE certification
4 5	Do not touch the device for 5 minutes after shutdown
RoHS	Comply with RoHS standards
X	Energy storage systems should be treated separately from domestic waste

#### 2.2 General Security

#### 2.2.1 Important Notice

Except for statutory provisions, the following conditions of the product are not covered by the warranty:

- a) For use with non-certified inverters / chargers,
- b) Use at ambient temperatures outside specifications,
- c) Transport damage, such as falls, deformation, violent influences, sharp objects,



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- d) Unauthorized modification, programming or repair,
- e) Water, cold, fire, dust, corrosive gas,
- g) Use with other types of batteries,
- h) Earthquakes, fires, storms and other force majeure factors,
- I) Use other than that specified in the operating instructions.

#### 2.2.2 General Requirements

- Do not power on during installation.
- It is strictly forbidden to install, use and operate any outdoor equipment or cables in bad weather such as lightning, rain and snow, wind of grade 6 and above (including but not limited to transportation equipment, operating equipment and cables, plugging and unplugging signal ports connected to the outdoors, working at height and outdoor installation).
- In the event of a fire, evacuate the building or equipment area and press the fire alarm bell or call the fire department. In any case, it is strictly prohibited to Enter the fire building.
- In any case, the structure and installation sequence of the equipment shall not be changed without the permission of the manufacturer.
- Do not damage the battery terminal assembly during transportation. In addition, the battery terminal bolt must not be lifted or shifted.
- Do not change, damage or block the markings and nameplates on this device.
- The composition and working principle of the entire photovoltaic power generation system should be fully understood, as well as the relevant standards of the country / region where the project is located.
- After the device is installed, remove empty packaging materials, such as cartons, foam, plastic, and cable ties, from the device area.

#### 2.2.3 Personnel Safety

• Wear appropriate personal protective equipment when operating this equipment. If any fault is found that may cause personal injury or damage to the equipment, stop the operation immediately, report to the responsible person, and take effective protective measures.



- Before using any tool, please learn the correct way to use the tool to avoid injury and damage to the device.
- When the device is running, the shell temperature is too high, which may cause burns. Therefore, do not touch the enclosure.
- To ensure personal safety and normal use of the device, ground the device reliably before using the device.
- Do not open or damage the battery. The electrolyte released by the battery is harmful to the skin and eyes, so avoid contact.
- Do not place unrelated items on top of the device or insert them anywhere on the device.
- Do not place flammable materials around the device.
- Do not put the battery in the fire to avoid an explosion and endanger personal safety.
- Do not place the battery module in water or other liquids.
- Do not short circuit the battery terminals, because a short circuit of the battery may cause a combustion accident.
- Batteries may cause excessive electric shocks and short circuits. When using batteries, note the following:
  - (a) Remove metal items, such as watches and rings, that you carry with you.
  - (b) Tools with insulated handles should be used.
  - (c) Rubber gloves and shoes should be worn.
  - (d) Disconnect the charging power supply before connecting or disconnecting the battery terminal.

(e) Check whether the battery has a ground fault. If the battery is grounded, disconnect the grounding cable.

- Do not use water or detergent to clean the internal and external electrical components of the cabinet.
- Do not stand, lean or sit on the device.
- Do not damage any parts of this device.



#### **2.3 Personnel Requirements**

- The personnel responsible for installation and maintenance must be strictly trained to understand all safety precautions and master the correct method of operation.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the device.
- The personnel who operate the equipment, including the operators, trained personnel, and professionals, must meet the requirements of the local country Special operation qualifications, such as high pressure operation, high altitude operation and special equipment operation qualifications.
- The replacement of this device or component (including software) must be performed by a professional or authorized person.

#### 2.4 Electrical Safety

#### 2.4.1 General Requirements



Before electrical connection, ensure that the equipment is not damaged, otherwise it may cause electric shock or fire. Do not install or remove any power cables while the power is on. The contact between the power cable and the conductor may generate electric arcs or sparks, which may cause fire or personal injury.

- All electrical connections must meet the electrical standards of the country in which the project is located.
- Cables prepared by users must comply with local laws and regulations.
- Special insulation tools should be used for high-pressure operations.
- Before connecting the power cable, ensure that the label on the power cable is correct.
- After the device is completely powered off, it is only allowed to operate the device within five minutes.



- When the cable is used in a high temperature environment, the insulation layer of the cable may age or be damaged. Therefore, the distance between the cable and the heat source must be at least 30mm.
- Cables of the same type should be bundled together. However, different types of cables should be kept at least 30mm apart and should not be wound together or used across.

#### 2.4.2 Grounding Requirements

- Before installing the device to be grounded, install the grounding cable. When removing the device, remove the protection ground cable at the end.
- Do not damage the ground conductor.
- Do not operate the device without a ground cable.
- The device should be permanently connected to the protection grounding cable. Before operating the device, check the electrical connections of the device to ensure that the device is grounded reliably.

## 2.5 Installation Environment Requirements

- This device is for indoor use only, do not use this product in outdoor environment.
- Do not install or use the device in a temperature lower than -10°C or higher than 50°C.
- The highest altitude at which this equipment can be installed is 2000 meters.
- This product should be installed in a dry, well-ventilated environment to ensure good heat dissipation performance.
- The installation location should be away from the fire source.
- The device should be installed and used away from children and animals.
- The installation location should be away from water sources, such as taps, sewage pipes and sprinklers, to avoid water entering the equipment.
- The device shall be placed on a firm, flat supporting surface.
- Do not place any flammable or explosive materials around the device.
- When the device is running, do not block the ventilation holes or heat dissipation system to avoid fire caused by high temperature.



The operation and service life of the accumulator are related to the operating temperature. The temperature at which the accumulator is installed should be equal to or better than the ambient temperature.		
Maximum temperature: +50°C Minimum temperature: -10°C		
Relative humidity: +5%~+95%		

# **3. Product Introduction**

#### **3.1 Product Introduction**

The energy storage system adopts lithium iron phosphate battery with excellent performance and long life. At the same time, it adopts modular structure design. Each energy storage module with the intelligent BMS system is internally integrated and easily expandable.

WY51100 can match inverters of major brands, such as SMA, Victron, Growatt, GoodWe, Deye, Jinlang, SRNE etc.

## 3.2 Description of Energy Storage Capacity

The energy storage system supports capacity expansion of up to 3 energy storage modules. Combining up to 15kWh battery packs.



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# **3.3 Description of Appearance**

## 3.3.1 Product Dimensions







## 3.3.2 Storage Battery Module



1	Switch	5	LED (SOC)
2	Negative terminal	6	CAN / RS485(Intercom interface)
3	Positive terminal	7	RS485(External communication interface)
4	Wall pulls	8	RESET

#### Communication interface definition

Communication Feature		Interface type	Picture	Instructions
RS485-1	Connected inverter	RJ45	12345678	1-RS485-B 2-RS485-A 7-RS485-A 8-RS485-B
CAN	Connected inverter	RJ45	12345678	4-CAN-H 5-CAN-L
RS485-2	Connect other batteries	RJ45	12345678	1-RS485-B 2-RS485-A 7-RS485-A 8-RS485-B



# 4. Application Scenarios

The energy storage module uses lithium iron phosphate battery with excellent performance and long life. At the same time, modular structure design is adopted. Each energy storage module and the smart BMS system is integrated internally and can be easily scaled up to a 15kWh battery pack.

The battery pack can be combined with the inverter to form an off-grid photovoltaic power storage system, which can solve the power problem in areas without electricity.

## 4.1 Applications in Different Environments

#### 4.1.1 With only Power Supply But no PV

When the power supply is normal, it charges the battery and supplies power to the load.



When the power supply is disconnected or stops working, the battery supplies power to the load through the power module.





#### 4.1.2 Where Only PV is Used but No Power Supply is Available

During the day, the photovoltaic directly supplies power to the load while charging the battery.

At night, the battery supplies power to the load through the power module.



At night, the battery supplies power to the load through the power module.



#### 4.1.3 Complete Application Scenarios

During the day, the power supply and PV simultaneously charge the battery and supply power to the load.





At night, the power supply supplies power to the load and continues to charge the battery if it is not fully charged.



If the power supply is disconnected, the battery supplies power to the load.



# 5. Product Installation

## 5.1 Check Before Installation

Before opening the outer packaging of the accumulator, check the outer packaging for visible damage, such as holes, cracks, or other possible insides signs of damage and confirmation of accumulator type. If there is any abnormality in the package or model of the accumulator, please do not open the package and communicate with it as soon as possible we contact.

After opening the outer packaging of the accumulator, check whether the delivered equipment is complete and whether there is obvious external damage. If any parts are missing or damaged, please contact us.



### 5.1.1 Installing Components

Before the installation, check whether the components are complete according to the table.

ID	Picture	Unit	Quantity	Specification	Source
1		Top cover	1	580×145×12 (mm)	Carton
2		Battery	2	5.12kWh / 51.2V	Battery pack
3		Base	1	580×145×60 (mm)	Carton
4		Mounting rack	1	200×68×20 (mm)	Carton
5		M4 screw	12	M4 combination screw	Carton
6	AND A REAL PROPERTY AND A	Screw	2	M4 self-attack Expansion screw	Carton



## 5.2 Installation Position

#### 5.2.1 Basic Requirements

- Before the installation, check whether the components are complete according to the table.
- Do not install in the storage area of flammable and explosive materials.
- If the accumulator is installed in a salt-affected area, corrosion and fire may occur. Therefore, do not install it in salt affected areas. A salt hazard area is defined as an area less than 500 meters from the coast or that will be affected by sea breezes. The areas affected by sea breezes vary depending on meteorological conditions (such as typhoons, monsoons) or topographic conditions (DAMS, hills).
- Do not install it where children can touch it
- The energy storage device cannot be installed forward, horizontal, reverse, backward or sideways.
- Wear safety goggles and protective gloves when drilling holes in walls or on the ground.
- During drilling, the equipment should be protected to prevent debris from entering. After drilling, clean up debris in time.
- When carrying any heavy objects, be prepared to bear them to avoid crushing or sprain.
- Wear protective gloves when operating the equipment with bare hands to avoid injury



When the product is heavy, Do not carry alone



To avoid crushing or sprain



#### 5.2.2 Installation Space Requirements

When installing an energy storage device, a certain space should be left around it to ensure sufficient space for installation and heat dissipation.



#### **5.3 Device Installation**

#### 5.3.1 Selecting an Installation Location

To determine the installation location, select a flat floor and solid wall as the installation location. Determine the installation position of the base. Second, determine where the battery is installed.

#### 5.3.2 Installation Process

First place the base on a flat ground, place the battery on the base, and then tighten the fixing screws on both sides.







The battery pack is very heavy and requires multiple people to install it together.

After installation, fix the wall pulling piece to the wall.



Install the second battery in the same way. The cover plate is then mounted on the battery pack.

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## 6. Electrical Connection

Before electrical connection, ensure that the energy storage switch is in the "Off" state. Otherwise, the high voltage of the device may lead to electric shock.
Operations related to electrical connections must be performed by professional electrical technicians. When making an electrical connection, Operators must wear personal protective equipment.

#### **6.1 Cable Preparation**

Serial number	Cable	Description	Suggested specification
1	Power cord	Power cable between the battery and the inverter	6AWG Cable
2	Signal line	Signal lines between battery modules or between batteries and inverters	8-pin network cable

## 6.2 Internal Electrical Connection of the Energy Storage Device

#### 6.2.1 Connecting Power Cables and Signal Cables

Before connecting the energy storage battery module, make sure that the energy storage battery is not working and the indicator light on the battery is off. The positive and negative poles of other batteries or power modules should be connected using the power cord provided with the product. It should be noted that the red cable wire is connected to the terminal marked with the "+" pole and the black cable wire is connected to the terminal marked with the "-" pole.



The power cord and signal cable delivered With the product are connected to the corresponding interface of the battery module as shown in the diagram.



#### 6.2.2 Setting the Storage Battery Module Address

If multiple energy storage battery modules are used in parallel, the modules automatically obtain the address code without operation.





When all wiring is complete and the system is functioning properly, close the side cover.



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## 8. System Maintenance

### 8.1 System Power off

After the system is powered off, there is still residual power and heat in the enclosure, which may cause electric shock or burns. Therefore, in the systemTo operate the accumulator 5 minutes after the power is off, protective gloves should be worn. Only when all lights of the accumulator are off Only then can the energy storage be maintained.

System power-off operation steps:

Step 1 Turn off the circuit breaker switch on the inverter with the battery pack input.

Step 2 Turn off the power button switch on all battery packs to ensure that all LEDs are successfully turned off and all LEDs are off.

#### 8.2 Routine Maintenance

Project	Method	Maintenance interval	
System cleanliness	Regularly check the radiator for covered or dirty	Every six months to once a year.	
System operating status	Observe whether the appearance of energy storage is damaged or deformed. Listen to whether there is any abnormal sound during the operation of theenergy storage. When the accumulator is running, check whether the energy storage battery indicator is correct.	Once every six months.	
Electrical connection	Check for disconnected or loose cable connections. Check the cable for any damage,especially if there are cuts in the sheath where the cable is in contact with the metal surface.	First commissioning and testing half a year after this	
Grounding reliability	Check that unused DC input terminals,energy storage terminals, COM ports,and cable covers are locked. Check that the grounding cable is reliably grounded.	It is then done every six months to a year.	



## 8.3 Storage and Maintenance of Batteries

#### 8.3.1 Battery Storage Requirements



Do not put the battery in the fire. The battery may explode. Do not open or damage the battery. The electrolyte flowing from the battery is harmful to the skin and eyes. Electrolytes can also be toxic;

1. When the battery is stored, it should be placed correctly according to the markings on the box. Do not lie upside down or on your side.

2. When stacking battery boxes, it should meet the stacking requirements on the outer packaging.

3. The battery should be handled carefully, and it is strictly forbidden to cause any damage to the battery.

4. Storage Environment Requirements:

- Ambient temperature: 10°C to 55°C, recommended storage temperature: 20°C to 30°C.
- Relative humidity: 5%RH-80%RH.
- Dry, well ventilated and clean.
- Should be kept away from corrosive organic solvents, gases and other substances.
- Direct sunlight should be avoided.
- Stay two meters or more away from the heat source.

5. When storing, disconnect the battery from the outside. If there is an indicator on the battery faceplate, the indicator should be off.

6. The warehouse manager will make statistics on the battery inventory every month and notify the planning department regularly. If any battery has been stored for nearly 15 months (-10°C to 25°C), 9 months (25°C to 35°C) or 6 months (35°C to 55°C), charging should be arranged in time.

7. When delivering the battery, the first-in-first-out principle should be followed.

8. After battery production and testing, it should be charged to at least 50% SOC before storage. If this device is not used for a long time, please discharge the battery to 45% to 60% of the battery capacity and disconnect the battery output to avoid battery drainage.



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9. Do not touch the battery pack with wet hands.

10. Do not crush, throW or puncture the battery.

11. Always dispose of batteries in accordance with local safety regulations.

12. The battery should be stored and charged in accordance with this user manual.

13. When storing or transporting batteries, do not reverse the polarity of the batteries, do not stack batteries Without protective packaging, and do not stack more batteries than specified on the packaging.

14. All operators of energy storage systems should comply With user manuals, installation and maintenance manuals, and quality assurance requirements.

Equipment damage caused by neglect or misreading of user manuals, installation and service manuals, and quality assurance requirements will not be eligible for product warranty.

#### 8.3.2 Battery Charging Requirements

Batteries stored for a long time (unused, more than 3 months) must be stored in a dry and cool place. The storage voltage is 51 V-53 V. The battery should be stored in a clean environment of 23±2 °C, and the humidity is 45%~75%. If the battery is not used for a long time, it should be refilled every 3 months Charge once to ensure that its voltage is within the above range.

For batteries and long-term storage, routine maintenance is required. Charge the battery to 40% at 0.2C according to the table below Charge status.

Storage ambient temperature	Storage environment relative humidity	Storage time	SOC
<- 10°C	/	Forbid	/
- 10°C ~25°C		≤12 months	
25°C ~35°C	5%~70%	≤6 months	30%≤SOC≤60%
35~45°C		≤3 months	
>45°C	/	Forbid	/



## 8.4 Equipment Cleaning

It is recommended to clean and maintain the equipment frequently. When cleaning, dust and stains should be removed from the product using a soft dry cloth or vacuum cleaner, especially Clean the radiators and vents on both sides of the product. Do not use organic solvents, corrosive liquids and other cleaning products to clean products. If The fan has failed and can be replaced by a professional.

# 9. Technical Data

Battery type	LiFePO₄	
Battery energy	5.12 kWh	
Battery capacity	100 Ah	
Battery voltage rating	51.2 V	
Battery operating voltage range	44.8~57.6 V	
Maximum charging current	100 A	
Maximum discharge current	100 A	
Depth of discharge	80%	
Tied quantities	3	
Design life	6,000	
Operating temperature	Charging: 0°C~60°C; Discharge: - 20 °C ~ 65 °C	
Operating humidity	5%~85%	
Nominal operating altitude	<2,000m	
Degree of protection	IP20	
Recommended working environment	Indoors	
Installation method	Vertical	
Total weight	47 kg	
Dimensions (L×D×H)	580×145×480 mm	



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# **10. Product Size and Packaging**

#### **10.1 Product Size**

The top cover dimensions are 580×145×12 mm, the energy storage battery module is 580×145×480 mm, and the base module is 580×145×60 mm.



#### 10.2 Package Size

The conventional packaging method for a single energy storage battery module is a carton with a size of 640×560×200mm.





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