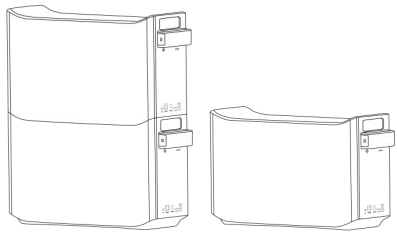
User Manual

Spring series LFP Battery

WD-G24100



Issue: 02

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How to Use This Manual

Read the manual and other related documents before performing any operation on the battery.
Documents must be stored carefully and be always available.
Contents may be periodically updated or revised due to product development. The information in this manual is subject to change without notice.

Trademarks and Permissions

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Software Licenses

* It is prohibited to use data contained in firmware or software developed by the manufacturer , in part or in full, for commercial purposes by any means.
* It is prohibited to perform reverse engineering, cracking, or any other operations that compromise the original program design of the software developed by the manufacturer.

Disclaimer

The manufacturer shall not be liable for personal injury, property loss, product damage and subsequent losses under the following circumstances:
* Damages caused by force majeure, including earthquake, flood, volcanic eruption, mudslide,, lightning, fire, war, military conflict,typhoon, hurricane, and so on.
* Failure to comply with the provisions of this manual.
* The installation, operation and storage environment does not meet the relevant international, national or regional standards;
* 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 or software.
* Incorrect shipment by yourself or the third party commissioned by you.
* Unsatisfactory materials and tools from you own that do not meet the relevant international, national or regional standards.
* Damage caused by yourself or the third party's negligence, intent, gross negligence, or improper operation.

Contents

1 Safety Instructions

Warning

Read and follow carefully all safety warnings and all instructions . Failure to do so may result in electrical shock, fire, serious injury, or death. Save these instructions for future reference.

1.1 Terms and Symbols

Terms /Symbols	Description
Danger	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
Warning	Indicates a hazard with a medium level of risk which, if not avoided, will result in death or serious injury.
Caution	Indicates a hazard with a low level of risk which, if not avoided, will result in minor or moderate injury.
Notice	Indicates a potentially hazardous situation which, if not avoided, could results in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
Note	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.
	Caution , risk of electric shock symbol indicates important safety instructions , which if not correctly followed , could result in electric shock.
	The DC input terminals of the inverter must not be grounded.
	Surface high temperature , Please do not touch the inverter case .
	Please read the instructions carefully before use .
	Indicate that this product is recyclable
	Do not place near open fire or incinerate. Do not use near heaters or hot temperature source.
	Attention! The risk of explosion.

	Li-ion battery
	Do not tread
	Do not run and chase
	Do not touch with your palm
	Symbol for the marking of electrical and electronics devices according to Directive 2002/96/ EC. Indicates that the device , accessories and the packaging must not be disposed as unsorted municipal waste and must be collected separately at the end of the usage . Please follow Local Ordinances or Regulations for disposal or contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

1.2 Safety Rules

1) After unpacking, please check product and packing list first, if product is damaged or lack of parts, please contact with the local retailer.
2) Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode.
3) Wiring must be correct. Always avoid incorrect or opposite connection of the positive and negative terminals. Make sure no short circuit with the external device.
4) It is prohibited to connect the battery and AC power directly.
5) Please ensured the electrical parameters of battery system are compatible to related equipment.
6) Do not allow the terminals to contact exposed wire or metal.
7) Keep out of reach of children or animals.
8) Do not place batteries near fire, heater or high temperature sources. This will reduce the risk of explosion or possible injury.
9) Batteries can explode in the presence of a source of ignition, such as open flame. An exploded battery can propel debris and chemicals. If occurs, flush with water immediately.
10) Do not submerge the battery in water or expose it to moisture. Do not disassemble or alter the battery in any way.
11) If the battery system needs to be moved or repaired, the power must be cut off and the battery is completely shut down.
12) It is prohibited to connect the battery with different type of Battery.
13) It is prohibited to put the batteries into use with faulty or incompatible power conversion system (hereafter refers to "PCS").
14) It is prohibited to disassemble the battery.
15) Please do not open, repair, or disassemble the battery except qualified personnel. We do not undertake any consequences or related responsibility which because of violation of safety operation or violating of design, production, and equipment safety standards.
16) Battery needs to be recharged as soon as possible after fully discharged.
17) Do not expose cable outside.
18) Do not expose battery to flammable or harsh chemicals or vapors.
19) Do not paint any part of Battery, include any internal or external components.
20) Do not connect battery with PV solar wiring directly.
21) Any foreign object is prohibited to insert into any part of battery.
22) Do not strike, drop, puncture or step on the battery. A damaged battery may explode. Properly dispose of damaged battery immediately.
23) In case of electrolyte leakage, keep leaked electrolyte away from contact with eye or skin, If that occurs, wash immediately with clean water for at least 10 minutes, then seek immediate medical attention.

2 Product Description

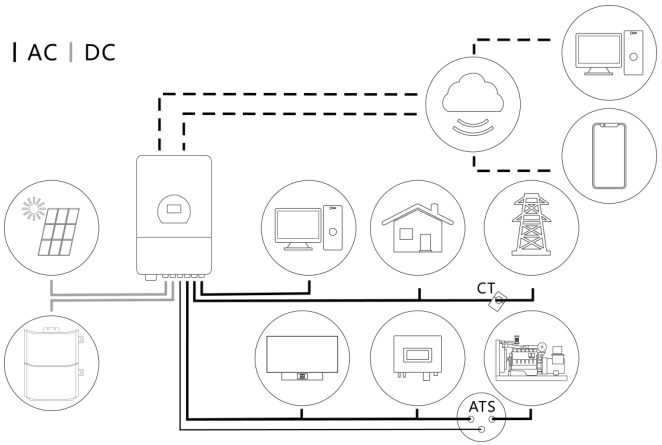
2.1 Product Features

1) The lithium iron phosphate battery is one of new energy storage products, which can be used to support reliable power for various types of equipment and systems.The whole module is non-toxic, non-polluting, and environmentally friendly.
2) This product has built-in BMS battery management system, which can manage and monitor cells information including voltage, current and temperature. Furthermore, BMS can balance cells charging and discharging to extend cycle life.
3) Cathode material is made from $LiFePO_4$ with safety performance and long cycle life.
4) Flexible configuration. Multiple batteries can be in parallel for expanding capacity and power.
5) Adopted self-cooling mode rapidly reduces system noise.
6) The module has less self-discharge, no memory effect, excellent performance of shallow charge and discharge.
7) High-power density: flat design, stack-mounted, saving installation space.
8) Restricted-current charging module can help improve battery life.

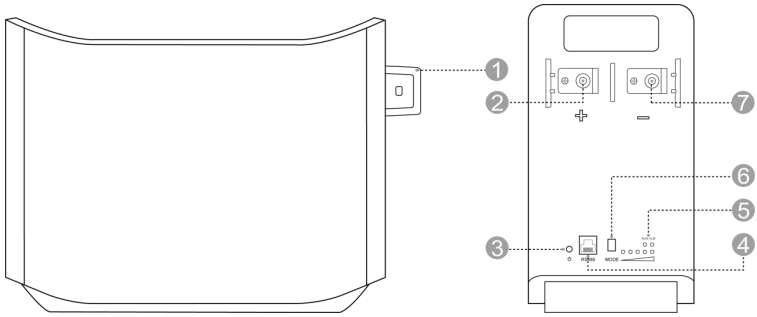
2.2 Application Scenarios

The following illustration shows basic application of this battery.
It also includes following devices to have a complete running system.
- Generator or Utility
- PV modules
- PCS (Charge & Discharge)

Consult with your system integrator for other possible system architectures depending on your requirements.



2.3 Product Overview



1. Protective cover	5. Status indicator
2. P+ port	6. Mode
3. Battery switch	7. P- port
4. COM port	

COM port

Follow the RS-485 protocol (baud rate: 9600), used to output battery information to the PCS through connection between COM port of the battery and BMS1 port of the PCS.

Mode

To identify the quantity of batteries in series.

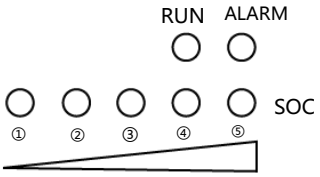
Condition	Connotation
00	One battery is used
01	Two batteries are used together in series

Battery switch

To power on /off the battery.

Status indicator

To indicate the status of the entire battery system, including SOC, RUN, and ALARM.



RUN LED: green light, to indicate the battery is in run.

ALARM LED: red light, to indicate if the battery is in alarm.

SOC LED: green light, to indicate the state of charge(SOC), each LED representing 20% SOC.

SOC LED Description											
Condition					Meaning	Condition					Meaning
No.1	No.2	No.3	No.4	No.5		No.1	No.2	No.3	No.4	No.5	
●	●	●	●	●	SOC:0-6%	●	●	●	●	●	SOC:0-6%, and not being charged
●	●	●	●	●	SOC: 6%-20%	● Flash	●	●	●	●	SOC:6%-20%, and being charged
●	●	●	●	●	SOC: 20%-40%	●	● Flash	●	●	●	SOC:20%-40%,and being charged
●	●	●	●	●	SOC: 40%-60%	●	●	● Flash	●	●	SOC:40%-60%, and being charged
●	●	●	●	●	SOC: 60%-80%	●	●	●	● Flash	●	SOC:60%-80%, and being charged
●	●	●	●	●	SOC: 80%-100%	●	●	●	●	● Flash	SOC:80%-100%,and being charged

Condition	Power off	Charge/ Discharge	Addressing	Alarm	Upgrade	Protection
RUN LED	Off	●				Refer to the appendix-1
ALARM LED		Off		●	● Flash fast	
SOC LED		● Flash	● Flash in turn			

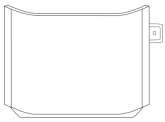
[1] ●: Green light stays on ●: OFF ●: Red light stays on

[2] ●Flash in turn: including 5 SOC LEDs and RUN LED

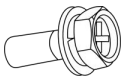
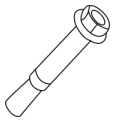
3 Preparation for Installation

After unpacking, check that packing contents are intact and complete , and free from any damage. If any item listed in the Unpacking List is missing or damaged, contact your vendor.

3.1 Unpacking List

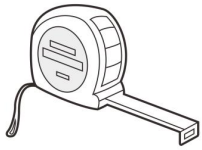
		
Battery pack	Fixed support*1	User manual*1

		
1000mm 4AWG negative battery power cable *1	1000mm 4AWG positive battery power cable *1	800mm 26AWG RJ45 communication line*1

	
Bolt*2 (M5)	Expansion bolt*2 (M6)

3.2 Required Tools

These tools are required to install the battery.

		
Hammer	Drill	Tape measure

		
Hex wrench	Phillips screwdriver	Marker


Diagonal pliers

Note!

Use properly insulated tools to prevent accident tale electric shock or short circuits.
If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

3.3 Safety Gear

It is recommended to wear the following safety gear when dealing with the battery pack.

		
Insulated gloves	Safety shoes	Safety goggles

4 Installation Instructions

4.1 Installation Personnel

• Only qualified professionals or trained personnel are allowed to install the equipment.
-Professionals:personnel who are familiar with the working principles and structure of the equipment, trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation.
-Trained personnel:personnel who are trained in technology and safety have required experience,are aware of possible hazards on themselves in certain operations and are able to take protective measures to minimize the hazards on themselves and other people.
• Personnel who plan to install the equipment must receive all necessary safety precautions and local relevant standards.
•Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
•Knowledge of electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.
• Understanding and complying with this document and other applicable documents.

4.2 Installation Environment

Danger!

Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.

Danger!

Do not store any flammable or explosive materials in equipment area.Do not cover or wrap the battery.

Danger!

Do not place the equipment near heat sources or fire sources, such as smoke, candles, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.

Warning!

Install the equipment in an area far away liquids. Do not install it under areas prone to condensation, such as under water pipe and air exhaust vent, or area prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.

Warning!

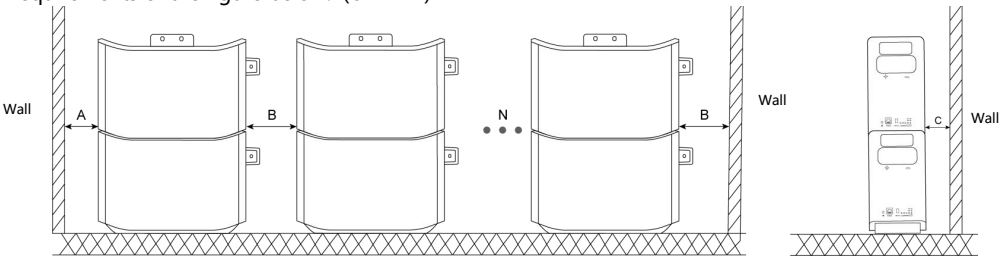
To prevent damage or fire due to high temperature, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.

• The installation and usage environment must meet relevant international,the local laws and regulations.The user is obliged to protect the equipment against fire or other hazards.
• Keep the equipment out of the reach of children and away from daily working or living area, including but not limited to the following areas:studio, bedroom, lounge, living room, music room, kitchen,game room, room theater, sunroom,toilet,bathroom,laundry,and attic.
• Do not install the equipment in places that are enclosed, poorly-ventilated without proper fire fighting facilities, or difficult for firefighters to access.
• Do not install the equipment in an easily accessible position because the temperature of the enclosure and heat sink is high when the equipment is running.
• Do not install the equipment on a moving object, such as ship, train, or car.
• Ensure that the equipment is installed in a clean, dry and well ventilated area with proper temperature, humidity and altitude range.Check for more data in the "Technical Specifications" section.
• Do not install the equipment in an environment with magnetic dust, volatile or corrosive gases, infrared and other radiations, organic solvents, conductive metal,or salty air.
• Do not install the equipment in an area conducive to growth of microorganism such as fungus or mildew.
• Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
• Do not install the equipment in an position that may be submerged in water.
• Keep away from the air outlet of PCS to prevent personal injury..
• The floor and walls are completely water proof.
• The wall and floor is flat and level.
• Before installing and powering up the system, dust and iron filings must be removed to keep the environment clean. The system cannot be installed in desert areas without a shell to protect against sand.
•The equipment is designed for indoor use. Please avoid direct sunlight, rain exposure, snow laying up during installation and operation.

4.3 Installation Clearance

Caution！

Batteries should be installed in a clean flat place with no direct sunlight, away from water and fire sources, and at a suitable temperature. The installation location is recommended to meet the size requirements of the figure below: （**0≤N≤7**）

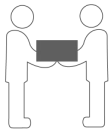
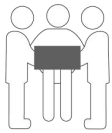
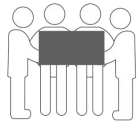
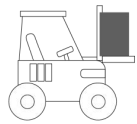


Item	Distance (mm)
A	≥200
B	≥600
C	12-24

Caution!

Moving heavy objects.

Be careful to prevent injury when moving heavy objects. Select an suitable way to moving heavy objects according to product weight.

Weight	Method	Recommendation
<18 kg (40lbs)	Manual handling	1 person
18~32 kg (40~70lbs)	Manual handling	2 persons
32~55 kg (40~70lbs)	Manual handling	3 persons
55~68 kg (121~150lbs)	Manual handling	4 persons
> 68 kg (150lbs)	Moving device	Forklift

4.4 Installing the Battery

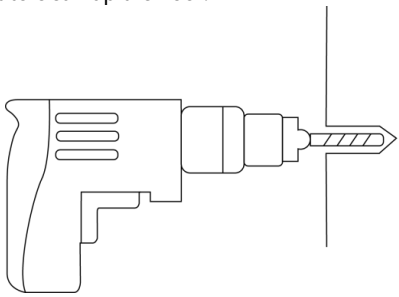
1. Drill two assembly holes on the wall prior to battery installation in accordance with data shown in the following table.

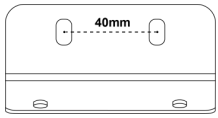
Note!

1) When drilling holes, pay attention to prevent dust from entering the battery, which may affect the battery performance and function.

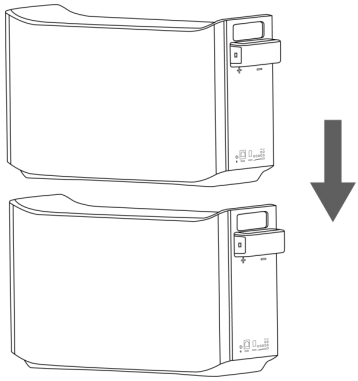
2) Ensure that the floor is level enough so as to avoid to influence hole drilling, such as height or location.

3) After drilling, never forget to clean up the floor.

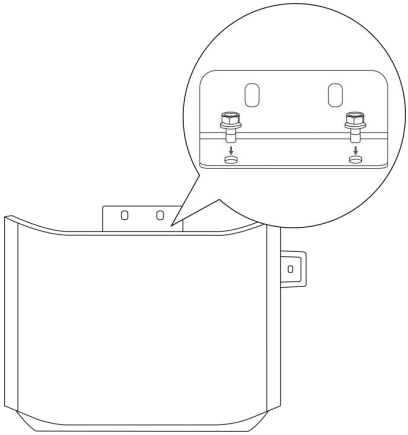


Model	Quantity of battery	Height/mm (from the ground)	Aperture/mm	Center distance/mm
WD-G24100	1 battery	351	Φ=8	CD=40 
	2 batteries	668		

2. Place one battery over another one in order to make all batteries stacked. The quantity of stacked batteries that are regarded as one cluster, is no more than 2.



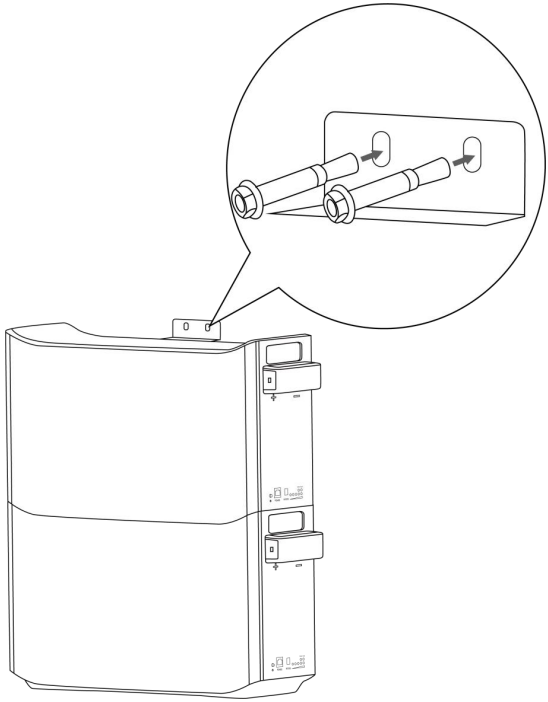
3. Use 2 screws of M5 to attach one fixed support to the top of the first battery.



4. Secure batteries to the wall using 2 expansion bolts (M6).

Note!

Remember to adjust to ensure that the battery is perpendicular to the ground.

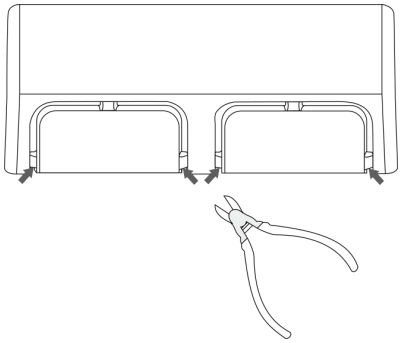


5 Electrical Connection

Caution！

When connecting to inverters or being in parallel mode, please use cables provided in the unpacking list. If other cables must be used in special cases, ensure they meet FCC standards.

Before wiring, remember to cut off the joint points on the protective cover according to your demands, in order to get access to connection for battery positive and negative lines.see the below drawing.



It should be noted that the maximum current of single battery system is **100A**. Exceeding 100A will cause heating of the connectors and cable, and in severe cases, it will cause a fire accident. As for cables, the recommended cross section of them should be at least **25 mm²** or **4AWG**.

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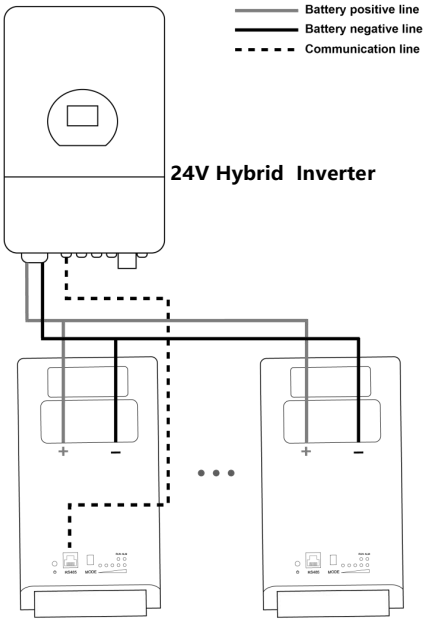
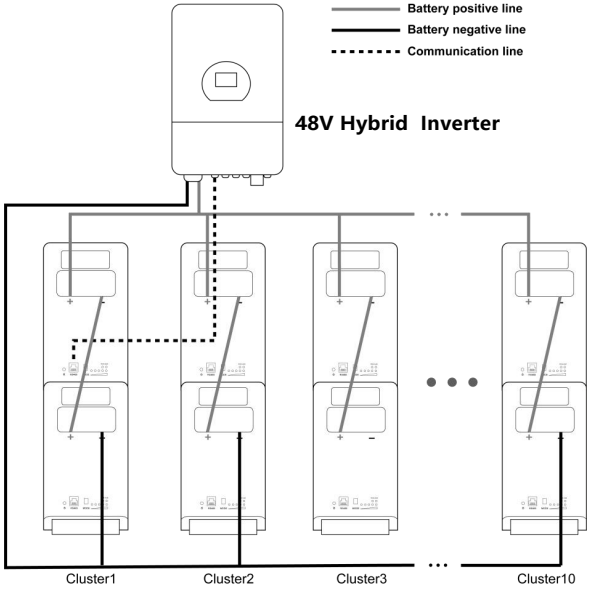
There are **2 different wiring modes** for you to meet your demands according to **voltages**.





6 Operation Instructions

6.1 Power on/off the Product

Before operating the product, ensure that:

• All cables are wired correctly and firmly.

• All fasteners including bolts and screws are tightened firmly.

• No bystanders or animals enter into the working area.

• Keep foreign objects , especially metal, away from the battery .

1. Press the battery switch to to turn on the equipment.
2. After you finish your work, press the battery switch to stop the equipment.

6.2 Charging/Discharging

If your batteries need to be charged or discharged at the lead-acid mode,set the float charging current to 0.1C. Adjust the absorption/equalization charge current and discharge current of PCS according to ambient temperature, with a maximum value of 1C:

Ambient temperature	Charge	Discharge
-20℃ ~0℃	\	≤0.3C
0℃ ~35℃	≤1C	≤1C
35℃ ~45℃	≤0.5C	≤1C
45℃ ~55℃	≤0.2C	≤0.2C

Charge voltage setting:

Voltage Type	Cell (V)	Module (V)
Float Voltage	3.4~3.45	27.2~27.6
Absorption/Equalization Voltage	3.6~3.65	28.8~29.2
Cut off Voltage	2.95~3.1	23.6~24.8

6.3 Buzzer

Your equipment is equipped with a buzzer, which will sound a alarm to reminder that you have to check whether your equipment is in the following situations:

Condition	Possible triggers	Solutions
Alert for 100ms at intervals of 2s with ALARM LED flashing	SOC≤ 5%，not being charged	Charge the battery in time
Alert once per second with the ALARM LED flashing simultaneously	Inverse connection of positive and negative lines when charging	Check and and then rectify the wire connection
	There is MOS adhesion existing	Contact the service center
	Cell voltage is higher than 3.8V	Check that sampling line is normal; Test the cell voltage using a multimeter; Inspect the SOH of the battery; Refer to data record for recharge at the low current.
	Discharge/charge temperature is higher than the valve value.	Check that there is rapid charge at the high current or there is a surge on load ; Check that there is long-time charge or over-discharge ; Check that the temperature of the environment around the battery ; Check that the battery is aged or damaged

7 Inspection, Cleaning and Maintenance

7.1 General Information

• The battery product is not fully charged. It is recommended that the installation be completed within 3 months after arrival;
• During the maintenance process, do not re-install the battery in the battery product. Otherwise, the performance of the battery will be reduced;
• It is forbidden to dismantle any battery in the battery product, and it is forbidden to dis- sect the battery;
• After the battery product is over-discharged, it is recommended to charge the battery within 48 hours. The battery product can also be charged in parallel or series. After the battery product is connected in parallel or series, the charger only needs to connect the output port of any product battery.
• Never attempt to open or dismantle the battery! The inside of the battery does not contain serviceable parts.
• Disconnect the Li-Ion battery from all loads and charging devices before performing cleaning and maintenance activities.
• Place the enclosed protective caps over the terminals before cleaning and maintenance activities to avoid the risk of contacting the terminals.
• All the battery terminals must be disconnected for maintenance.
• Please contact the supplier within 24 hours if there is something abnormal.
• Do not use cleaning solvents to clean battery.

7.2 Inspection

• Inspect for loose and/or damaged wiring and contacts, cracks, deformations, leakage, or damage of any other kind. If damage to the battery is found, it must be replaced. Do not attempt to charge or use a damaged battery. Do not touch the liquid from a ruptured battery.
• Regularly check the battery’ s state of charge. Lithium Iron Phosphate batteries will slowly self-discharge when not in use or whilst in storage.
• Consider replacing the battery with a new one if you note either of the following conditions:
-The battery run time drops below 70% of the original run time.
-The battery charge time increases significantly.

7.3 Cleaning

If necessary, clean the Li-Ion battery with a soft, dry cloth. Never use liquids, solvents, or abrasives to clean the Li-Ion battery.

7.4 Maintenance

The Li-Ion battery is maintenance-free. Charge the battery to approximately > 80% of its capacity at least once every year to preserve the battery capacity.

8 Storage

• The battery product should be stored in a dry and cool environment;
If the battery is stored for long time, it is required to charge them every six months, and the SOC should be no less than 50%.
• Generally, the maximum storage period at room temperature is 6 months. When the battery is stored over 6 months, it is recommended to check the battery voltage. If the volt- age is higher than 25.6V, it can continue to store the battery. In addition, it is needed to check the voltage at least once a month until the voltage is lower than 25.6V. When the voltage of the battery is lower than 25.6V, it must to be charged according to the charging strategy.
• The charging/discharge strategy is as follows: discharge the battery to the cutoff voltage with 0.2C current, and then charge with 0.2C current for about 3 hours. Keep the SOC of the battery at 40%~60% when stored.
• When the battery product is stored, the source of ignition or high temperature should be avoided and it should be kept away from explosive and flammable areas.

9 Troubleshooting

Please contact the service center to ask for help if solutions mentioned in the below chart cannot help you solve problems.

Fault Type	Possible Causes	Solutions
Cell over-voltage protection	The voltages of one or more cells are higher than the valve value	1. Test the cell voltage using a multimeter; 2. Inspect the SOH of the battery;
Cell under-voltage protection	The voltages of one or more cells are lower than the valve value	1. Test the cell voltage using a multimeter; 2. Inspect the SOH of the battery;
Battery over-voltage protection	Sum voltage is higher than the valve value	1. Test the cell voltage using a multimeter; 2. Inspect the SOH of the battery;
Battery under-voltage protection	Sum voltage is lower than the valve value	1. Test the cell voltage using a multimeter; 2. Inspect the SOH of the battery;
Charge over-current protection	Charge current is higher than the valve value in certain times	1. Check that short-circuit exists in the charging port or lines 2. Check that PCS settings are normal
Discharge over-current protection	Discharge current is higher than the valve value in certain times	1. Check that there is a surge on load when batteries are used. 2. Check that short-circuit exists in discharging port or lines
Charge over-temperature protection	Cell temperature is higher than the valve value	1. Check that there is rapid charge at the high current ; 2. Check that there is long-time charge ; 3. Check the temperature of the environment around the battery ; 4. Check that the battery is aged or damaged

Charge under-temperature protection	Cell temperature is lower than the valve value	Make sure the battery is in a reasonable ambient temperature
Discharge over-temperature protection	Cell temperature is higher than the valve value	1. Check that there is a surge on load when batteries are used. 2. Check that there is long-time charge ; 3. Check the temperature of the environment around the battery ;
Discharge under-temperature protection	Cell temperature is lower than the valve value	Make sure the battery is in a reasonable ambient temperature
Excessive cell voltage differentials	The difference between the highest and lowest voltage of cells is more than the valve value	Contact the service center
Excessive temperature differentials	The difference between the highest and lowest temperature of cells is more than the valve value	Check the temperature of the environment around the battery ;
Mos over-temperature protection	MOS temperature is higher than the valve value	1. Check the temperature of the environment around the battery ; 2. Check the charge/discharge current
OCD1	AFE discharge over-current protection (Class I)	Contact the service center.
OCD2	AFE discharge over-current protection (Class II)	
AFE UV	AFE under-voltage fault	
AFE OV	AFE over-voltage fault	
OCDL	Discharge over-current lock	

SCD	Discharge short-circuit protection	
SCDL	Discharge short-circuit lock	
AFE communication fails	Abnormal communication between AFE and MCU	
Mosfet short-circuit	\	
EEPROM fault	\	
Pre-charge fails	\	
Inverse connection of positive and negative lines when charging	\	
Voltage sampling interrupts	\	
Temperature sampling interrupts	\	
Charge under-voltage	\	1. Check that the PCS matches your batteries or the PCS is in normal voltage ranges 2. Contact the service center
Connector overheating fault	\	Check that lines are crimped or screws are tighten firmly

10 Technical Specifications

Model		WD-G24100
Main Parameter		
Battery Chemistry		$LiFePO_4$
Nominal Capacity (Ah)[1]		100
Nominal Voltage (V)		25.6
Operating Voltage (V)		22.4~29.2
Nominal Energy (kWh)[1]		2.56
Cell configuration		Prismatic, 1P8S
Scalability		Max. 2 units in series (51.2V) and Max.10 units in parallel
Charge Current[2]	Max. Continuous (A)	100
	Peak (A)	200 (10 sec)
Discharge Current[2]	Max. Continuous (A)	100
	Peak (A)	200 (10 sec)
Other Parameter		
Recommend Depth of Discharge		80% DoD
System Dimension (W/D/H, mm)		471*160*348
Weight Approximate (kg)		21
Case Material		PC+ABS
LED Indicator		LED (SOC,working, protecting) & Buzzer
Communication		RS-485
IP Rating of Enclosure		IP20
Operating Temperature		Charge: 0 ~ 55℃ Discharge: -20℃ ~ 55℃
Storage Temperature		0 ~ 35℃
Relative Humidity		95%
Altitude		≤2000m
Installation		Stack-Mounted, Floor-Mounted
Cycle Life		≥6000 (25℃±2℃,0.2C charging and discharging, 80%DOD, 70%EOL)
Certification		UN38.3, MSDS

[1] Test condition: 25℃±2℃, at beginning of life and calibration mode, 0.2C charge &0.2C discharge, 100% DOD.

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

11 Environmental Disposal

Used batteries can not be disposed of as household waste. You are obliged to handle waste batteries, such as removal of privacy on product, and return them to designated or authorized recovery point according to applicable regulations and standards on waste battery disposal.

Attention:

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 http://www.deyeess.com. Do not dispose of batteries as household waste!

12 Transportation Requirements

1. The battery products should be transported after packaging and during the transportation process. Severe vibration, impact, or extrusion should be prevented to prevent sun and rain. It can be transported using vehicles such as cars, trains, and ships.
2. Always check all applicable local, national, and international regulations before transporting a Lithium Iron Phosphate battery.
3. Transporting an end-of-life, damaged, or recalled battery may, in certain cases, be specially limited or prohibited.
4. The transport of the Li-Ion battery falls under hazard class UN3480, class 9. For transport over water, air and land, the battery falls within packaging group PI965 Section I. Use Class 9 Miscellaneous Dangerous Goods and UN Identification labels for transportation of lithium-ion batteries which are assigned Class 9. Refer to relevant transportation documents.

Miscellaneous Dangerous Goods and UN Identification Label

Appendix-1 Lamp Language

Your product is so designed that you can judge what happens to the battery system by lamp language, which delivers information through the sequence and frequency of LEDs lighting up.

Error	LED1	LED1	LED3	LED4	LED5	ALARM[1]	ALARM[2]
Cell over-voltage protection	*					*	
Cell under-voltage protection		*				*	
Battery over-voltage protection	*	*				*	
Battery under-voltage protection			*			*	
Charge over-current protection	*		*			*	
Discharge over-current protection		*	*			*	
Charge over-temperature protection	*	*	*			*	
Charge under-temperature protection				*		*	
Discharge over-temperature protection	*			*		*	
Discharge under-temperature protection		*		*		*	
Excessive cell voltage differentials	*	*		*		*	
Excessive temperature differentials			*	*		*	
Mos over-temperature protection	*		*	*		*	
ALARM_ID_AFE_OCD1	*	*	*	*		*	
ALARM_ID_AFE_OCD2					*	*	
ALARM_ID_AFE_UV	*				*	*	
ALARM_ID_AFE_OV		*			*	*	
ALARM_ID_AFE_OCDL	*	*			*	*	
ALARM_ID_AFE_OCC			*		*	*	
ALARM_ID_AFE_SCD	*		*		*	*	
ALARM_ID_AFE_SCDL				*	*	*	
AFE communication fails	*			*	*	*	
Cell voltage sampling fails		*		*	*	*	
Temperature sampling fails	*	*		*	*	*	
MOS short-circuit			*	*	*	*	
EEPROM error	*		*	*	*	*	
Pre-charge fails	*	*					*
Inverse connection of positive and negative lines when charging			*				*
Voltage sampling interrupts		*	*				*

Temperature sampling interrupts	*	*	*				*
Charge under-voltage				*			*
Connector overheating fault	*			*			*
Current-restricted MOS high-temperature protection	*		*	*			*

[1] ALARM[1]: representing the ALARM LED keeps on when some troubles occurs

[2] ALARM[2]:representing the ALARM LED flashes frequently when some troubles occurs