



28KWh Energy Storage System



Product Name: **LiFePO4 Battery pack For Energy Storage System**

Product Model: JG-CN-28-01


DOC NO: JGCN19-01

REV: R3.2





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Quality Statement

Proper usage and maintenance will ensure that the energy storage battery operate reliably and consistently for long periods of time.

- ◆ After receiving the product, please check if the packaging is intact. If the packing is broken, it may cause damage to the product. If there is any damage, please contact our after-sales or sales staff within five working days.
- ◆ Anyone who do not use or maintain the battery according to the provisions of this manual is deemed to have waived the warranty right. Shandong Goldencell Electronics Technology Co., Ltd. and its service station have the right to no longer guarantee the warranty, and will not compensate for any losses arising from it. But the corresponding paid service can be provided according to the situation.

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1 Technical Parameter

The energy storage system is composed of LiFePO₄ battery, protection system, UPS, cabinet and other auxiliary components. The energy storage power supply has long cycle life and high reliability; small volume, light weight, high energy density, environmental friendly; wide operating temperature range, high and low temperature performance; high efficiency, energy saving, stable power supply, high power output; flexible, simple and diverse system assembly.

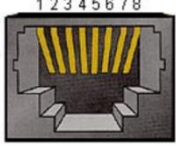

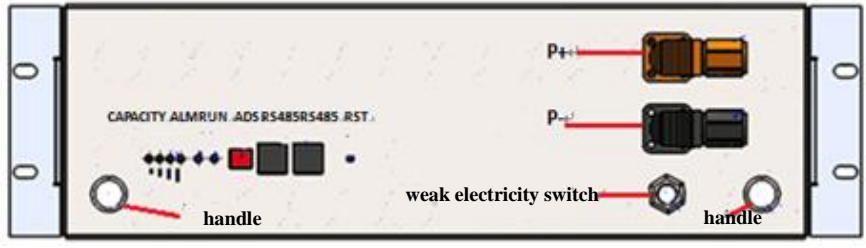
1.1 System Parameter

Items	Parameter	
Product Name	LiFePO ₄ Battery For Energy Storage Power Supply	
Product Model	JG-CN-28-01	
System Energy	28KWh	
System Power	7KW	
Size	About 670mm*717mm*1767mm	
ACInput	185V-290V	
ACOutput	220V50HZ	
Wave Shape	pure sine wave	
Cycle Time	2000times (100%DOD)	capacity retention rate≥80%
	4000times (80%DOD)	
	7000times (50%DOD)	

1.2 Battery Parameter

Items	Parameter	
Battery Model	51.2V68Ah	
Battery Type	LiFePO ₄	
Normal Voltage	51.2V	
Rated Capacity	68Ah	
Min capacity	65Ah	
Energy	3481.6Wh	
Resistance	≤60mΩ	
Size	(528±4) mm * (420±3) mm * (130±2) mm	
Shell Material	CRS (Cold Rolled Steel)	
Charge Voltage	57.6±0.2V	
Float Voltage	55.2V	
Discharge Cut-off voltage	About 40V	
Charge Current	10A	
Charging cut-off current	0.68A-1.36A	
Discharge Current	Working Current	50A



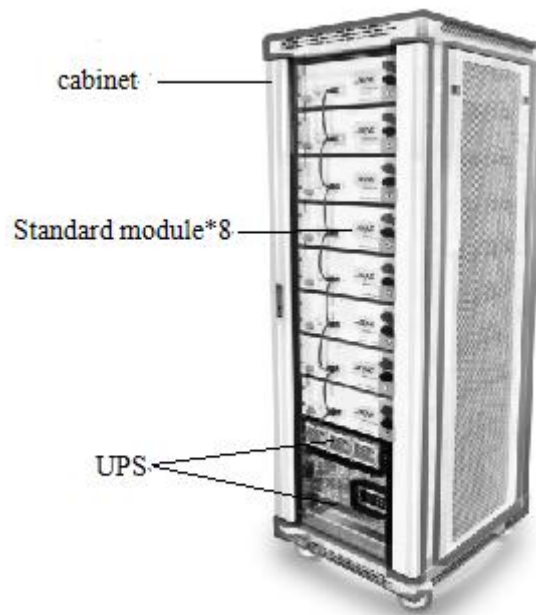
Protection Circuit	Over charge protection, Over discharge protection, Temperature protection, Balanced function, Communication function
Positive	Connector / orange
Negative	Connector / black
RS485Communication	
Reset Switch	Activate, Hibernate
Dip Switch	
Battery Panel	
Cycle mode	Charge according to the standard charging I_5 , rest 0.5~1 h; Then Discharge according to standard discharge I_5 , rest 0.5~1 h.

1.3 UPSParameter

Technical Index		Parameter	
Inverter	DC Input	Rated Input Voltage (Vdc)	48V
		Input DC voltage allowable range	40-60V
	AC Output	Rated Capacity (VA)	10kVA
		Rated Output (W)	7000W
		Output Voltage Tolerance (V)	220±2%
		Output Frequency Accuracy (Hz)	50±0.2%
		Wave Shape	pure sine wave
		Total Harmonic Distortion(THD)	≤3% (Linear load)
		Dynamic Response Time	5% (Load0↔100%)
Charger	AC Input	Input Voltage	185V-290V
	DC Output	Output Voltage	Max: 57.6V
		Power	≤6KW



2 Energy Storage System Components



3 System Function Introduction

- Voltage detection and protection function

With single voltage, overall voltage detection, overcharge, overdischarge alarm and protection

- Current detection and protection function

With charge and discharge current detection, alarm, protection

- Temperature detection and protection function

With temperature detection and protection

- Short circuit protection

- Battery pack capacity estimation function

The full capacity, current capacity and design capacity of the battery pack can be set by the host computer, and the capacity can be automatically updated after a complete charge and discharge cycle.

- Battery charge balanced function

- LED indicator function

There are 6 LED indicators, 4 of which are the power indicator to indicate the current battery pack SOC, one for the running indicator and the other for the alarm indicator.

- Hibernate(dormancy)function

Standby time exceeds 24 hours (no communication, no charge and discharge, no charge)

- Storage function

Maximum storage of 500 pieces of history information, including the number of protectiontimes , the point and current total voltage, current, temperature, power and operating status.

- RS485 Communication function

RS485 communication interface, using isolated communication.BMS can communicate with the host computer through the RS485 interface, so as to view various information of the battery in the



upper computer, including battery voltage, current, temperature, status, SOC, SOH and battery production information, etc., and can perform parameter setting and corresponding control operations. The default baud rate is 9600 bps, and when the RS485 interface is used in parallel for the battery pack, the Main Pack communicates with the Pack through the RS485 interface, so that all the Pack information can be viewed through the Main Pack.

● Host computer control function

The upper computer software control function, through the host computer software can be conveniently set the protection parameters such as overcharge, over discharge, charge and discharge overcurrent, over temperature and under temperature, capacity, standby, balance, storage and other parameters.

- Pure sine wave output with strong load capacity and wide application range.
- Low working noise and high efficiency.
- The power supply uses LiFePO4 battery, which has high safety, green and pollution-free and other characteristics.

Table1 LED working status indicator

Status	Normal/Alarm/ Protection	RUN	ALM	Power indicatorLED				Remark
		●	●	●	●	●	●	
Shutdown	Hibernate	Off	Off	Off	Off	Off	Off	All Off
Standby	Normal	Flash1	Off	According to electric quantity indication				Standby
	Alarm	Flash1	Flash3					Module low voltage
Charge	Normal	On	Off	According to electric quantity indication (Highest power indicator LED flash 2)				Highest powerLED flash(flash2) , Overcharge alarmALM no flash
	Alarm	On	Flash3					
	Overcharge Protection	On	Off	On	On	On	On	Without mains electricity, the indicator is in standby state.
	Temperature, Overcurrent, Invalidation protection	Off	On	Off	Off	Off	Off	Stop charging
Discharge	Normal	Flash3	Off	According to electric quantity indication				
	Alarm	Flash3	Flash3					
	Under-voltage protection	Off	Off	Off	Off	Off	Off	Stop discharge
	Temperature, Overcurrent, Short Circuit,	Off	On	Off	Off	Off	Off	Stop discharge



	reverse connection,Invalidation protection							
Invalid		Off	On	Off	Off	Off	Off	Stop charging and discharge

Table 2 Capacity indication

Status		Charge				Discharge			
Capacity indicator		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
Power (%)	0~25%	Off	Off	Off	Flash2	Off	Off	Off	On
	25~50%	Off	Off	Flash2	On	Off	Off	On	On
	50~75%	Off	Flash2	On	On	Off	On	On	On
	75~100%	Flash2	On	On	On	On	On	On	On
Running indicator light●		On				Flash(Flash3)			

4 Battery Service Environment

Energy Storage Battery working environment is 0°C~+50°C(When the environment temperature>45 °C,please pay attention to the ventilation and heat dissipation); Environment humidityRH≤85%, pay attention to waterproof when environment humidity > 85%, at the same time the battery surface condensation phenomenon should be avoided. Working altitude is less than or equal to 2000m.

5 Special Attention



In order to make full use of the energy efficiency of the battery and prevent accidents such as leakage or heat generation, please prohibit the followings:

- Do not immerse the battery in the water. Once it is in the water, isolate it immediately and ask a professional to deal with it.
- Do not charge, discharge and leave the battery at temperatures over 50°C. also keepaway from fire, heater or corrosive materials. Otherwise, it can cause overheat, fire, or function failure, shortened life, or even danger happening.
- Do not charge the battery at temperature below 0°C.
- Do not reverse the neutral line and the live line of the energy storage power supply, do not short circuit the neutral line and the live line of the energy storage power supply,the energy storage power supply must be connected to the ground line and ensure good grounding.
- The power supply itself cannot be connected in parallel, while the battery parts can be used in parallel.
- Do not reverse polarity charging. Do not connect the battery electrodes to an electrical outlet.
- Do not transport or store the battery together with metal objects such as hairpins,necklaces, etc.
- Do not strike, trample, throw, fall and shock the battery.
- Do not directly weld the battery and pierce the battery with a nail or other sharp objects.
- Do not use the battery in the location where static electricity and magnetic field is strong.



- Otherwise the battery protection circuit may be damaged.
- Do not overload the battery.
 - Do not machine the circuit board, which may damage the internal circuit and cause function failure.
 - Do not deform the product under pressure, which may cause electronic components or part of the circuit damage, and make the product unstable.
 - Do not remove the case, in case of unnecessary damage.
 - Do not overcharge or overdischarge the battery.
 - Please charge the battery within 12 hours after using. If the battery is not charged for more than 12 hours after using, please test the battery voltage before charging. If the voltage of the battery is $<32V$, do not charge, need to place in isolation. Meanwhile please contact our technical staffs of Shandong Goldencell Electronics Technology Co., Ltd.
 - If the battery leaks and liquid splashes into the eyes or skin, do not rub, wash it with clean water, and immediately seek medical attention.
 - In case of accidental fire, dry powder fire extinguisher or sand should be used.
 - If the battery gives off strange odor, generates heat, becomes discolored or deformed, or any abnormality appears during use, storage, or charging, please stop charging and using immediately, remove and isolate it from the device in the safe way.
 - The electrode of the discarded battery terminal should be covered with insulating paper to reduce the safety hazard when laying aside.
 - Reversing the Positive and negative charging terminal will burn the internal circuit board, please pay attention to the positive and negative terminal when connecting.

6 Battery Usage and Maintenance

6.1 Battery storage

Storage temperature $0^{\circ}C \sim 40^{\circ}C$ (Optimum storage temperature $15^{\circ}C \sim 25^{\circ}C$, drypreservation) Battery performance is affected by temperature, the most obvious is the change in battery capacity, this is normal phenomenon.

Avoid condensation caused by temperature changes during storage, otherwise it will lead to the rust of batteries or metal parts.

6.2 Battery Checking before using

- After receiving the battery, first check the packing carefully, please ensure there's no shock on the battery during the handling process.
- Please check the battery case and accessories if there's any damage, leakage or loss, if so, please contact us immediately.
- Please check the output connector is correct or not, measure whether the positive and negative is reversed and whether the voltage is within the normal standard. In case the battery terminals are dirty or rusts, clean the terminals with a dry cloth before use. Otherwise poor performance may occur due to the poor connection with the instrument.

6.3 Installation and Precautions

- Please clean up the installation position of the battery to ensure no dust, metal or other foreign materials. No smoking or fire during installation to avoid short-circuit of battery and prevent equipment damage or personal injury.
- The battery should be installed under the condition with well-ventilated and no sunlight.



Don't put it under place with possible flooding. The using and storage of the battery should be kept away from inflammable and explosive materials.

- When fastening battery terminals, please don't use excessive force, or the terminals could be damaged.
- After installation, please check whether the terminal fastening is in place and whether there are sundries on the surface of the battery. Clean the surface of battery with dry cloth, please don't use oil or other volatile organic solvents to clean, or it may damage it.
- Please make sure that the positive (+) & negative (-) polarity is correctly connected, or it may fire or damage the battery and electrical appliances.
- Test to run the equipment, observe whether the equipment and battery are abnormal.

6.4 Battery Work Requirements

- The operating power shall not exceed the specified system power.
- When the battery is short of power, it should be charged in time, which is beneficial to extend the battery life. If the battery is not charged in time, battery is in the state of power shortage for a long time, battery life will be affected.
- The lithium-ion energy storage battery charge and discharge shallow is beneficial to improve the cycle life. Suggest user each discharge be put to 80% of the nominal capacity.

6.5 Battery Usage & Maintenance

- The battery would be possible to be at the over-discharged state by its self-discharge characteristics in case the battery is not used for long time. In order to prevent over-discharging, the battery shall be charged periodically to maintain a certain voltage range(53.28-54.4V), 2 months one cycle. (for battery with communication function, please maintain it once in 1 month) What's more, the SOC/ capacity calibration shall be performed. The calibration method is to charge fully with charger, then discharge to over-discharged protection state.
- Don't use organic solvents to clean the battery case.
- Battery is a consumable product with limited cycle life. Please change it in time when the capacity can't reach the requirement to avoid any loss of the user.
- In order to prevent the safety problem caused by the failure of the protection board overcharge protection function, do not charge for a long time. After the battery is fully charged, remove it. In addition, use the original charger or the one attached to the battery and operate it according to the instructions. Otherwise, the battery may be damaged or cause danger.
- The shallow charge and discharge of the battery ensures that the battery can be used economically. Overcharge and overdischarge may cause the battery overheat, fire or function failure, shorten life, or even danger.
- The battery switch, battery display board and USB are consumed components, which are not included in the after-sale scope. A paid after-sales service is available.
- Waste lithium batteries should be recycled and disposed in accordance with local laws.



7 Other Technical Indicators

If battery protection parameters and other related parameters are needed, please contact our sales or technical staff, we will provide the information as soon as possible. Your understanding is highly appreciated. Welcome to visit our website or call the customer service hotline for more product information.

8 Products Disclaimer

Shandong Goldencell Electronics Technology Co., Ltd. is not responsible for the incident caused by not obeying the Manual. Before using the battery, you should read the specifications, usage instruction and some attentions carefully to learn its application method and areas. If the phenomenon such as incorrect using method or wrong circuit connection, or input power data, working index are inconsistent with the Manual, cause damage to product, load and its accessories, we are not responsible for it.

Our company has the right to change the content of specification without prior notice. The final explanation of specification belongs to our company.