



BSL NEW ENERGY TECHNOLOGY CO.,LTD

User Manual

MatchBox LVS

Low Voltage Stacked Battery Systems

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LiFePO4 Battery System for Households

1. About This Manual

1.1 Purpose

This manual describes the introduction, installation, operation and emergency situations of the battery bank. Please read this manual carefully before installations and operations. Keep this manual for future reference.

1.2 Scope

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

1.3 Safety Instructions

Warning: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. CAUTION---To reduce risk of injury, damage, even burst. Please use it following using manual. In case of causing personal.
3. Do not disassemble the battery. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. CAUTION-Only qualified personnel can install this device with inverter.
6. For optimum operation of this battery, please follow required spec to select appropriate cable size.
7. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion or fire.
8. Please strictly follow installation procedure.
9. To support full output load, at least 2 sets of LPBF48V for inverter larger than 6KVA in parallel connection.

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1.4 Grounding Instructions

This System should be connected to a permanent grounded wiring system. Be sure to comply with local requirements.

1. NEVER cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.
2. Warning!! Only qualified service persons are able to service this device.
3. Battery should be installed indoor and kept away from water, high temperature mechanical force and flames.
4. Do not install the battery in any environment of temperature below 0°C or over 55°C, and humidity over 80%.
5. Do not put any heavy objects on the battery.

1.5 Can be connected in parallel

1. The batteries can be connected in parallel. Series connection is not allowed. Use in upright position only.
2. The batteries are not allowed to be connected with PWM controller for charging.

Special Attention: Due to the built-in protection board of the lithium battery pack is with over-discharge protection function, it is strongly recommended to stop using the load when the battery pack is over-discharged. The battery pack cannot be repeatedly activated for discharge. Or the battery may be failed to be activated by the AC or PV activation cable

(It requires a special charging activation method), so cannot be charged. Therefore, when the battery pack is low power, please charge the battery as soon as possible when main power or solar energy is available.

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2. Introduction

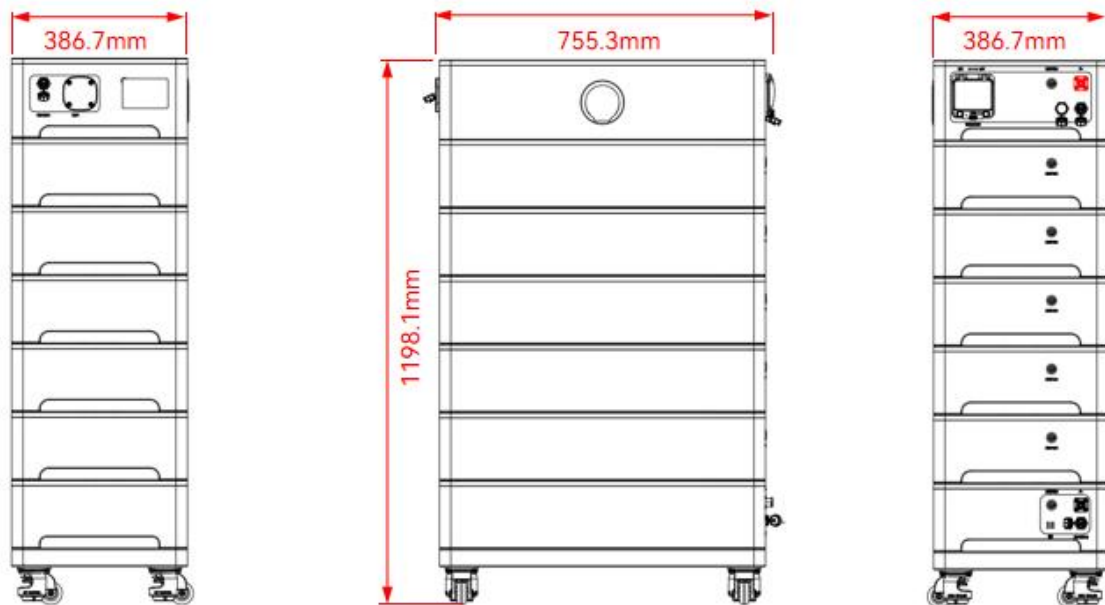
MatchBox LVS is a low-voltage battery system with a stacking design. A single battery module is 5.32kWh. It can be quickly stacked and expanded in a plug-and-play manner without the need for cumbersome wiring. It can meet residential energy storage needs of 10kWh to 36kWh.

2.1 Features

- Modular and scalable
- Higher energy density
- 10-year warranty & technical support
- 30 days delivery period
- For on-grid and off-grid
- Higher battery stability
- UL Standard Battery Module
- Higher system efficiency
- Safe and reliable LiFePO4

2.2 Product Over View

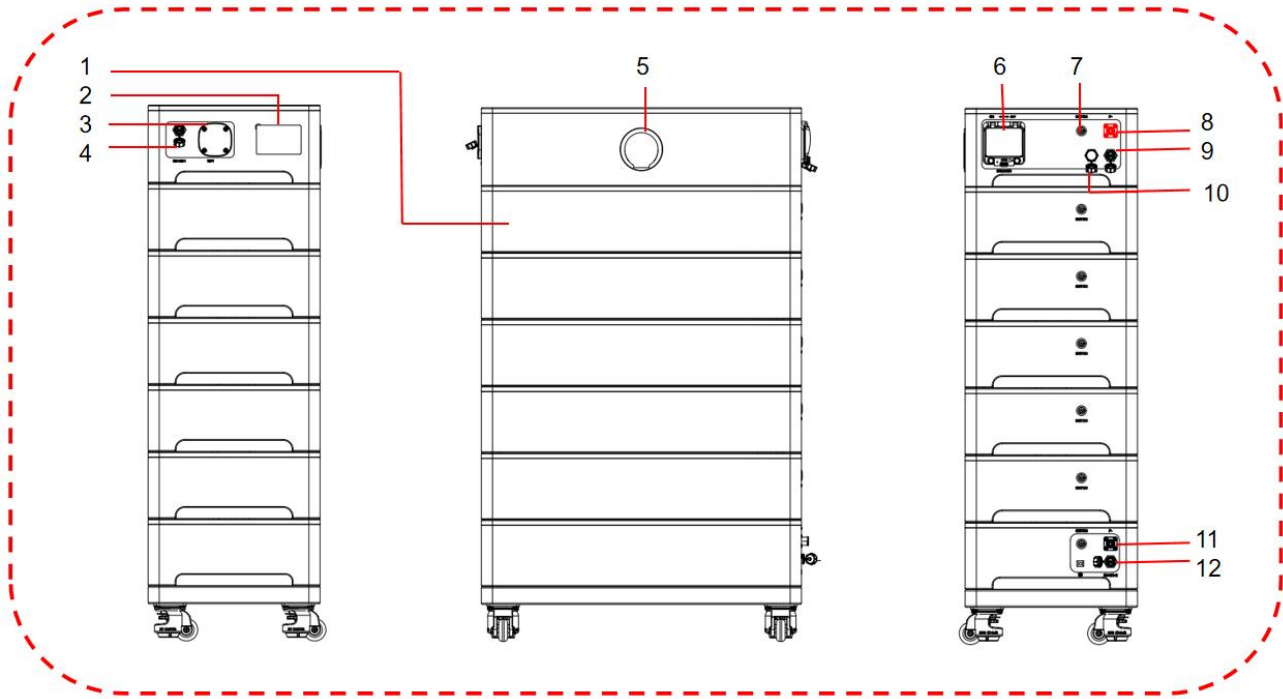
MatchBox LVS



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2.3 Product Details

MatchBox LVS



No.	Illustration	Silk-screen	Remark
1	Battery Pack	/	Battery protective casing
2	Battery Nameplate	/	That is the "battery ID"
3	WIFI Interface	WIFI	The Wi-Fi encryption stick can be inserted
4	RS485-1 Parallel Interface	RS485-1	RS485-1 and connect the communication ports
5	BMS Display Screen	/	Used to display detailed information
6	Breaker	ON/OFF	Battery string output enable switch
7	BMS Switch Button	Switch	Button activation BMS
8	Battery Positive Terminal post	P+	Positive output
9	CAN Bus Interface	CAN	The communication port connected to the inverter
10	RS485 Interface	RS485	Communication port for the monitoring equipment
11	Battery Negative Terminal Post	P-	Negative output
12	RS485-2 Parallel Interface	RS485-2	RS485-2 and connect the communication ports

LiFePO4 Battery System for Households

2.4 Specifications

Model	LVS2	LVS3	LVS4	LVS5	LVS6	LVS7
Rated voltage (V)	DC51.2					
Cell model(LFP-3.2V)	3.2V 102Ah 51.2V 5.32kWh					
System configuration	16P2S	16P3S	16P4S	16P5S	16P6S	16P7S
Number of modules	2	3	4	5	6	7
Rate power(KWh)	10.44	15.66	20.88	26.1	31.32	36.54
Rated capacity(Ah)	204	306	408	510	612	714
Voltage range(V)	44.8~57.6					
Max. charging current	200A					
Max. discharging current	200A					
Dimensions (W*D*H,mm)	720*385*290(±5)	720*385*440(±5)	720*385*590(±5)	720*385*740(±5)	720*385*890(±5)	720*385*1040(±5)
Pack weight(kg)	100±3%	145±3%	190±3%	235±3%	280±3%	325±3%
Communication protocol	CAN /RS485					
Host software protocol	Wifi & Bluetooth (Option)					
Operation temperature range	Charge:0~45°C					
	Discharge: -20~55°C					
Cycle Life(25°C)	>3000 cycles @90% DOD					
Protection level	IP65					
Storage temperature	0°C~35°C					
Storage humidity	10%RH~90%RH					

LiFePO4 Battery System for Households

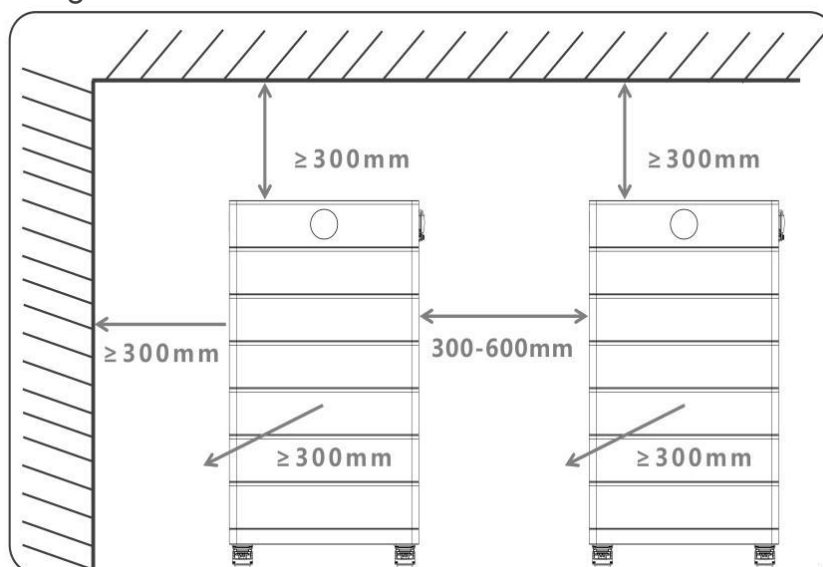
3. Installation

3.1 Pre-installation Inspection

1. **Outer package check:** Verify whether the outer package is intact and undamaged, including whether there are deformation, open holes, cracks or other traces that may lead to damage of the inner equipment.
2. **Equipment Model and Deliverables Inspection:** Verify whether the equipment model matches the order; confirm whether the type and quantity of deliverables are correct, and check whether the appearance is damaged.

3.2 Installation Environment

1. **Installation environment requirements:** Equipment shall not be installed in a flammable, explosive, corrosive environment; and the installation location should be to avoid contact with children, and should choose a location that is not easy to accidentally touch; at the same time, pay attention to the surface of the equipment may produce high temperature when running, to prevent scalding.
2. **Installation location notes:** Avoid installing near water pipes, cables, etc. Inside the wall to prevent damage to the battery. The installation environment should avoid direct sunlight, rain, and snow. It is recommended to install it in a well-ventilated place indoors. If necessary, install an air-cooled air conditioner.
3. **Installation space and environmental conditions:** Ensure that the installation space meets the ventilation and heat dissipation of the equipment and operating space requirements; the protection level of the equipment is suitable for indoor installation, and the temperature and humidity of the installation environment should be kept within the appropriate range.



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4. **Equipment installation height and protection:** Equipment installation height should be easy to operate and maintain, to ensure that the indicator lights, labels are clearly visible, easy to operate the terminals; equipment installed at an altitude of not more than 2000 meters.
5. **Electromagnetic interference protection:** The installation location should be away from strong magnetic fields to avoid interference; if the installation location near the radio station or wireless communication equipment below 30MHz, the distance between the battery and these devices should be greater than 30 meters.
6. **Installation carrier requirements:** The use of non-flammable materials (such as concrete, masonry or fire treatment of wood metal); carrier needs to be strong, can withstand the weight of the equipment; battery system to be installed against the wall, and add anti-tipping bracket.
7. **Installation angle requirements:** Equipment must be installed horizontally, avoid tilting or inverted.

3.3 Electrical Connection



Danger:

1. Safe power off operation

Be sure to completely disconnect the equipment in the battery system before performing any operation on the equipment to prevent electric shock accidents; Strictly comply with the safety precautions in this manual and the safety signs on the equipment;

2. Electrical connection specifications

During the electrical connection process, cables and component specifications that comply with local laws and regulations must be used;

The same type of cable should be tied together and ensure that different types of cables are arranged separately to avoid the cables from entangling or crossing each other;

3. Precautions for pressing terminal blocks

When pressing the terminal, it is necessary to ensure that the cable conductor part is fully in contact with the terminal;

It is strictly prohibited to press the cable insulation skin together with the terminal, which may lead to the failure of the equipment to operate normally, or heat up during operation due to unreliable connection, and then damage the inverter terminal block.

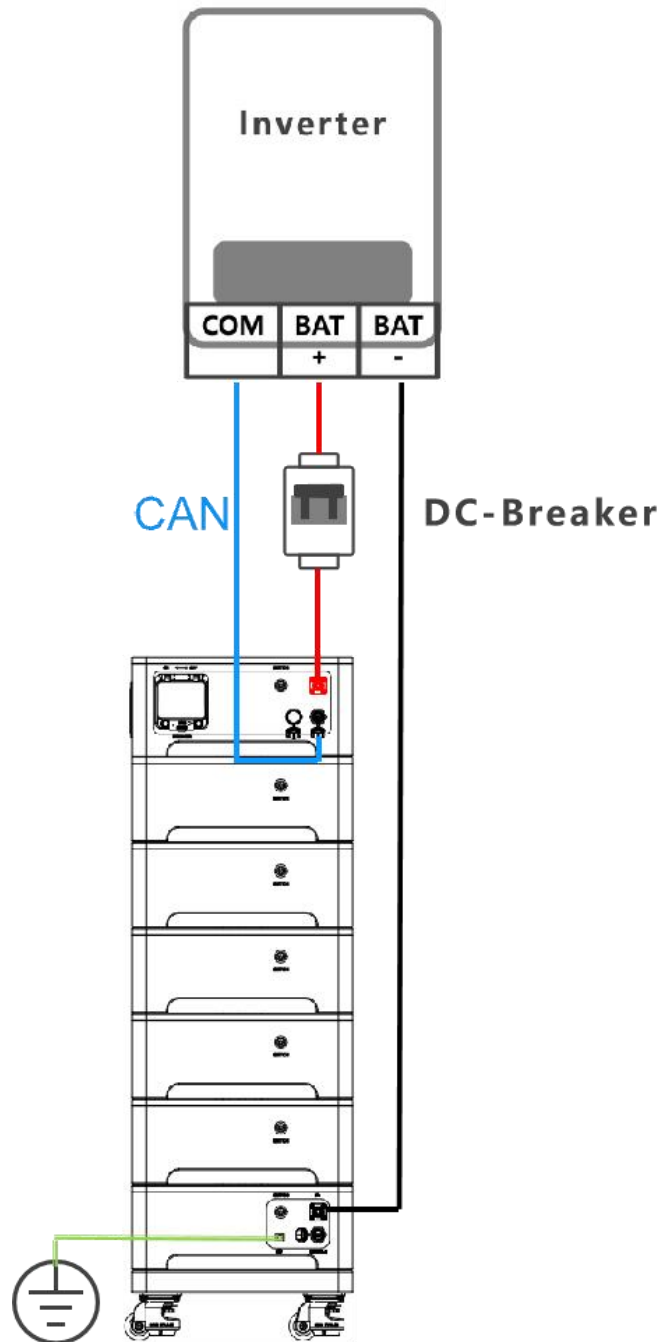


Note:

1. Electrical connection operation is limited to professional personnel;
2. The cable color shown in the figure is only for reference, and should be selected according to the specific situation in practice;
3. Ensure that the cable specifications used comply with local laws and regulations.

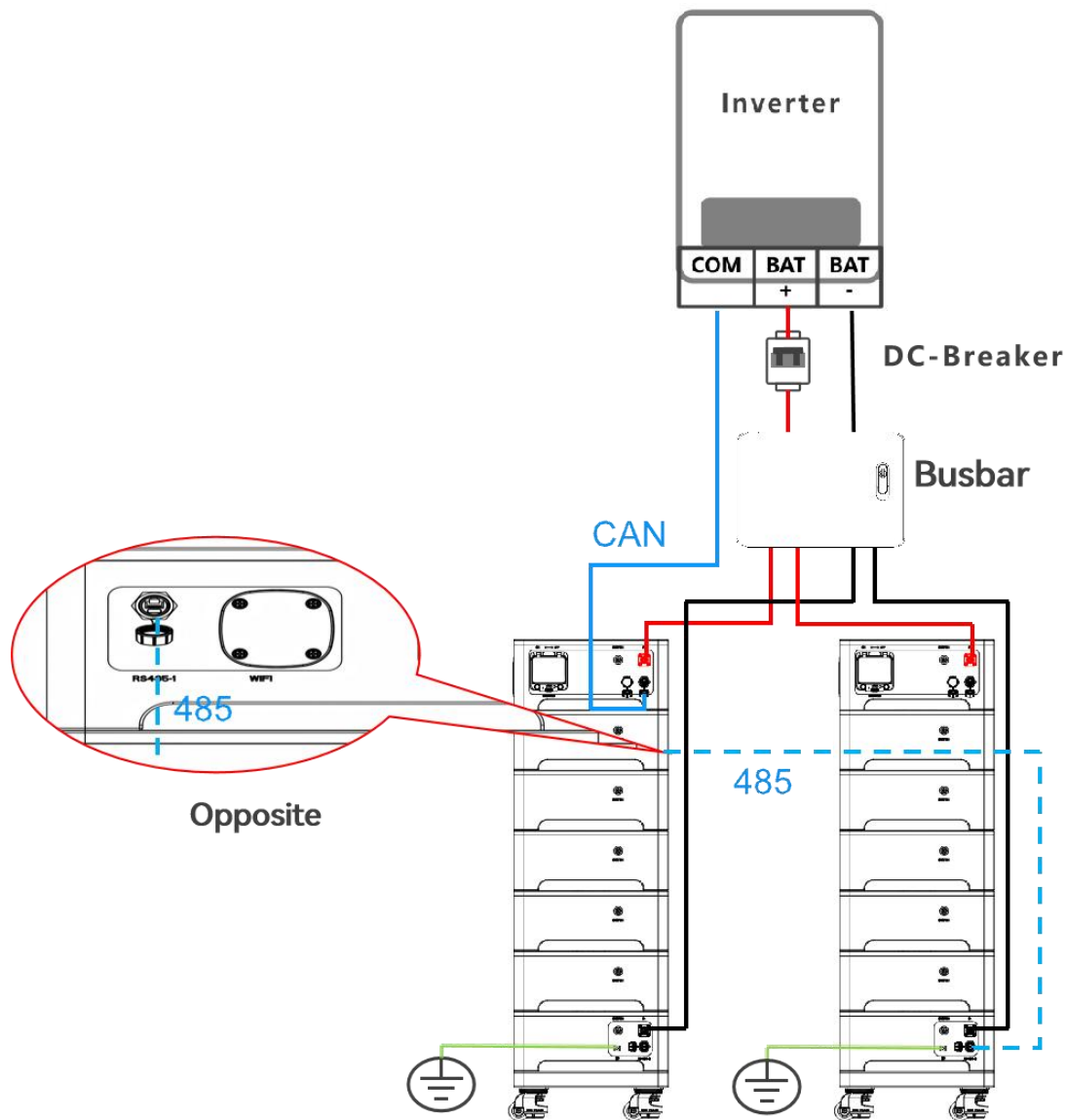
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Single battery system



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Integrated battery system



Notice : A combiner box needs to be added for parallel connection, and a maximum of two clusters can be connected in parallel, which amounts to 14 battery packs.

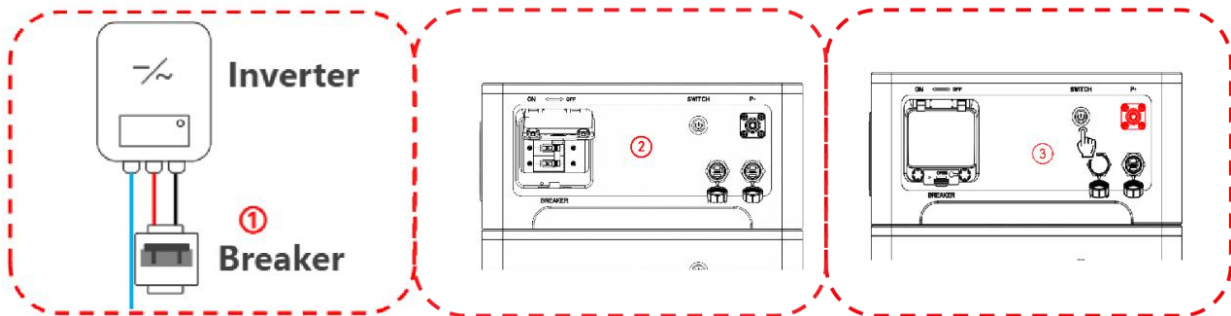
LiFePO4 Battery System for Households

4. Operation

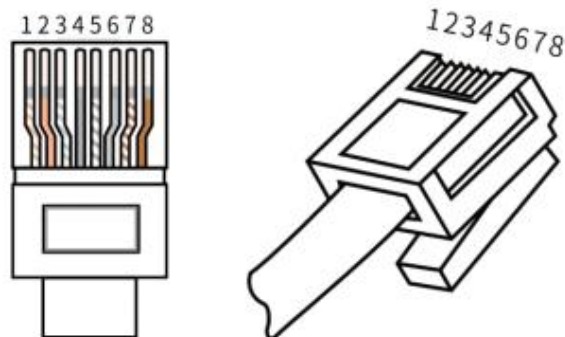
4.1 Switch On/Off

After the battery is connected, please follow the following steps to start:

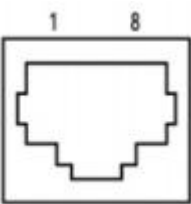
1. Confirm that the power cable and the communication wiring are properly connected.
2. Close the "Breaker" between the inverter and the battery.
3. Close the "Breaker" on the "LVS" battery.
4. Press the "Switch" buttons on the "LVS" battery from top to bottom in sequence.
5. Perform the shutdown operation, and do the reverse procedure.



4.2 Description for Communication port

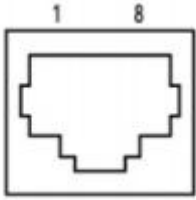


RS485:

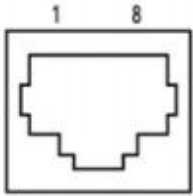
Picture	PIN	Description
	1	RS485B1
	2	RS485A1
	3	GND
	4	NC
	5	NC
	6	GND
	7	RS485A1
	8	RS485B1

LiFePO4 Battery System for Households

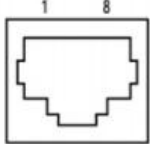
CAN:

Picture	PIN	Description
	1	NC
	2	NC
	3	NC
	4	CANL
	5	CANH
	6	NC
	7	GND
	8	NC

RS485-1:

Picture	PIN	Description
	1	RS485B
	2	RS485A
	3	GND
	4	UP_IN
	5	NC
	6	GND
	7	RS485A
	8	RS485B

RS485-2:

Picture	PIN	Description
	1	RS485B
	2	RS485A
	3	GND
	4	DN_OP+
	5	GND
	6	GND
	7	RS485A
	8	RS485B

4.3 Battery Display Screen

This product's display screen allows viewing of relevant battery parameters for this product, as referenced below:

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The RS485 interface can be used for connecting to the upper computer:



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5. Emergency Situations

5.1 Fire

In case of fires, make sure that the following equipment is available near the system.

- SCBA (self-contained breathing apparatus) and protective gear in compliance with the Directive on Personal Protective Equipment 89/686/EEC.
- NOVEC 1230, FM-200, or dioxide extinguisher

Batteries may explode when heated above 150°C. KEEP FAR AWAY from the battery if it catches fire.

5.2 Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

- Inhalation: Evacuate the contaminated area, and seek medical attention.
- Contact with eyes: Rinse eyes with running water for 5 minutes, and seek medical attention.
- Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical attention.
- Ingestion: Induce vomiting, and seek medical attention.

5.3 Wet Batteries

If the battery pack is wet or submerged in water, do not let people access it, and contact your supplier for help.

Damaged batteries are not fit for use and are dangerous and must be handled with the utmost care. It may leak electrolyte or produce flammable gas. If the battery pack seems to be damaged, pack it in its original container, and then return it to your supplier.

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6. Warranty Service

6.1 Warranty Period

In case of correct use of the product, the warranty period agreed in the commercial contract shall prevail.

6.2 Warranty Scope

During the warranty period, if the product is caused by quality problems, our company will repair or replace the product for free. Customers should reserve a reasonable response time for our company's repair, and the replaced product will be handled by our company. Customers need to show relevant proof of purchase of the product and ensure that the product trademark is clearly visible, otherwise our company has the right to not provide warranty guarantee.

6.3 Disclaimer

In the following situations, our company has the right not to provide quality assurance, but can still provide paid maintenance services.

1. The warranty period has expired;
2. Failure to provide relevant proof of product purchase;
3. Damage caused during transportation, loading and unloading;
4. Damage caused by improper installation, modification or dismantling by unauthorized personnel;
5. Damage caused by operation under abnormal conditions or environment;
6. Machine malfunctions or damages caused by the use of non-Fanuc components or software;
7. Faults caused by irresistible factors such as fires, earthquakes, floods, etc.



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