



FOGSTAR ENERGY

SR51.2V SERVER RACK BATTERY

USER MANUAL
V.2 2023

WWW.FOGSTAR.CO.UK



FOGSTAR ENERGY

Here at Fogstar, we've made it our mission to make Lithium Iron Phosphate batteries affordable and accessible to everyone. We've also made the manufacturing process a transparent one.

Your Fogstar Energy SR51.2V Server Rack Battery comes complete with heating, several pre-loaded inverter protocols, TFT LCD touch screen, 16 Grade A EVE Cells, a DC Rated Breaker and an 8 year warranty.

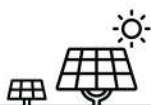
As a relatively small business based in Worcestershire, we've set our sights on providing customers with the very best product and customer service experience.

In this manual you'll find lots of useful information about your Fogstar Rack Battery. Of course, if you don't find the answers to your questions, you can always get in contact with our friendly team and we will always be happy to help.

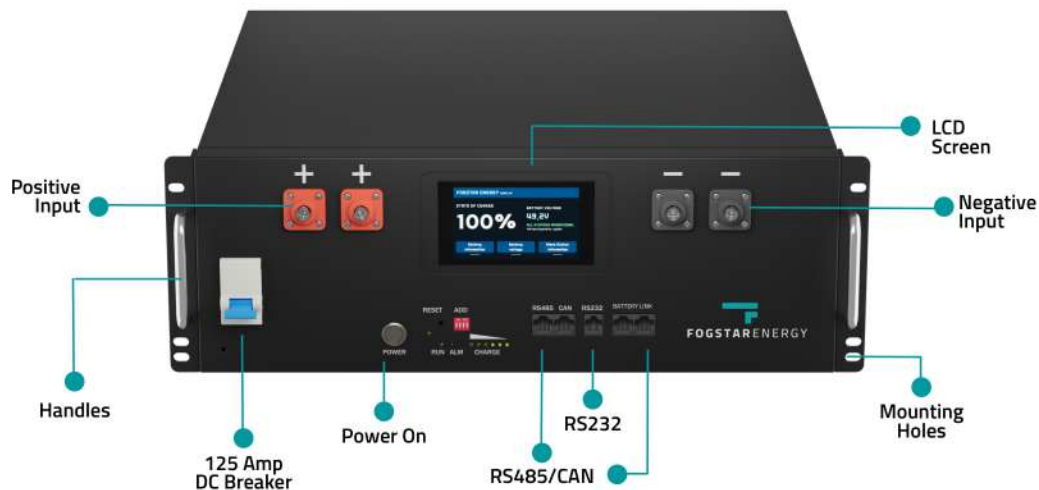
The Fogstar Team

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The Fogstar Energy 3.5U rack batteries are 450(W) x160(H) x 440(L) mm in size



PACE

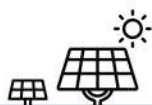
Battery Management System

PACE BMS Data	48v 100A
Maximum Discharge	100A
Max Charging Current	100A
Temperature Protection	YES
OverCurrent Protection	YES
OverDischarge Protection	YES




Specifications
ESR5 1.2V 5.12KWH

Rated Voltage	51.2v
Charge Limited Voltage	57.6v
BMS	PACE 100A
LiFePO4 Cells	EVE LF100LA (Grade A)
Nominal Capacity	100ah
Minimum Capacity	96ah
Maximum Charge Current	100A
Rated Energy	5.12Kwh
Maximum Discharge	100A
Discharge Cut-off Voltage	43.2V
Discharge Temperature	-20°c to 60°c
Charging Temperature	-20°c to 45°c (heater enabled)
Storage Temperature	1 Month: -20°c ~ 60°c 3 Months: -10°c ~ 40°c 1 Year: -5°c ~ 20°c
Relative Humidity	45% ~ 85% RH
Cell Configuration	16S1P
Cycle life	4000 Cycles @ 80% DOD 6000 Cycles @ 50% DOD
Communication Port	CAN, RS485, RS232
Design life	15 years
Weight	45.2kg
Preloaded inverter Protocols	Victron, Pylontech, Growatt, Solis, Goodwe.
Rack Unit Size	3.5U
Price per kWh	£245.00



Battery Safety

- Wear proper safety gear such as gloves and eye protection
- These batteries are HEAVY (45kg) - always get help to lift them
- Do NOT lift or move these batteries whilst in the Fogstar Rack Cabinets - they are likely to topple
- Ground your cabinets before you insert your rack battery
- Do not reverse polarity
- Do not connect with any batteries in series
- Ensure the system is properly grounded
- Always use insulated tools
- Do not work on battery with it turned on or with the grid turned on
- Do not connect battery to solar wiring directly
- Make sure all fasteners are properly torqued
- Ensure your chargers/inverters are appropriately programmed
- Use only on 48v nominal systems, do not connect with other batteries (such as 15s)
- Ensure the installation follows applicable local, national and all legal electric stipulations
- Installation should be done by a qualified and knowledgeable person
- Make sure proper cable sizes and overcurrent protection are utilised
- Ensure the system is installed in a location suitable for electronics
- Keep the battery within safe operational temperatures
- Do not put the battery in a hazardous, hot or flammable environment
- Install your equipment in a location where children and pets are not present
- Do not paint, or spray paint the battery
- If there are any electrical smells or excessive heat, use your breaker switch and contact your local fire station
- Only clean the battery with a dry cloth - do not use any liquids, spray cleaners, aerosols or any type of solvents.

Setting up your battery

This manual is intended to give you a brief overview of the steps required to set-up your battery, cabinet and connect the Fogstar Rack Battery to your inverter.

Installation takes approximately 20-30 minutes for 6 racks and a cabinet.

1. Setting up your cabinet, unboxing your battery and installing racks into the cabinet.
2. Installing battery cables and completing the battery assembly.
3. Connecting battery to PC.
4. Changing inverter protocol.



1. Setting up your cabinet, unboxing your battery and installing racks into the cabinet

1a. The Arrival of your Battery

Your battery and cabinet will arrive on a pallet, and they are heavy! (the battery is 48KG and the cabinet is 20kg). Please ensure you have a friend or family member to help you.

Your empty cabinet can be rolled into place, and secured using the extendable legs.

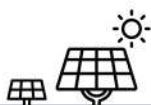
1b. How to access the Cabinet

The cabinet can be opened by pressing the key hole on the handle. This then releases the handle so you can gain access. Each cabinet comes with two sets of keys. Please remove these from inside the cabinet, and keep them safe. It is best practice to lock the cabinet if children and animals are present.

1c. Inserting the Batteries into the Cabinet

Once you are happy that the cabinet is secure, you can slide your first battery into one of the shelving units inside the cabinet. You can then fix the batteries, by using the black M6 bolts and washers.

Continue to do this for all the batteries in your system, securing them with the bolts and washers as you go.



2. Setting up your cabinet, unboxing your battery and installing racks into the cabinet



Please make sure that the battery is OFF and the BREAKER on the battery is in the OFF (DOWN) position before progressing.

2a. Connecting RS485 Battery Linking Cables

This diagram presumes that your main battery will be your top most battery in the cabinet. The diagram below shows the RS485 Linking cable ports.

1. The left port (number 1) connects to the next battery (sending communication).
2. The right port (number 2) receives the connection from the previous battery (receiving communication).

The main battery at the top should only have one RS485 linking cable in the right port. Your bottom battery should only have one RS485 in the left port. All middle batteries should have cables connected to both.



2b. Configuring DIP Switches

Now your batteries can communicate with each other, we need to tell them where they are in the order of things (at the moment they all think they are battery number 1).

We can do this by adjusting the DIP switches. These are the red and white 'ADD' switches located on the front of the battery.



2c. Connecting the Positive and Negative Busbar cables

We can now connect the negative busbar cables. The cables we provide connect both negative terminals on the battery (M8 bolts) to the negative busbar of the cabinet with an M10 bolt.

Connect all negative leads first. We recommend leaving one M10 bolt free on the BOTTOM of the busbar to attach the negative inverter cable.

We can now connect the positive busbar cables the same way, but onto the positive busbar of the cabinet. We recommend leaving one M10 bolt free on the TOP of the bus bar to attach the positive inverter cable.

2d. Connecting Inverter Cable Positive and Negative.

Connect the negative inverter cable to the bottom of the negative busbar using one of the spare M10 bolts in the busbar, and the positive inverter cable to the top of the positive busbar.

You can run both of these cables out of the top or bottom of the cabinet through the cable exit holes.

This stage will vary depending on your inverter manufacturer. Please consult the manual of your inverter manufacturer for more in depth details. Most inverters will have a positive, negative and ground connection on the bottom for the battery bank.



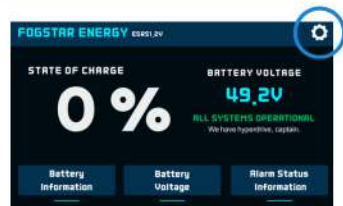
You can now turn ON all your batteries with the POWER button, however your DC BREAKER should remain in the OFF (DOWN) position until you have changed your inverter protocol.

3. Updating the Inverter Protocol

3a. Updating the Inverter Protocol via the Touchscreen

You can update your Inverter protocol via the Touchscreen on the battery, this negates the need for downloading the Pbms Tools BMS Software.

1. Hit the 'Settings' button in the top right hand corner
2. Select CAN or RS485 communication type
3. Select the correct protocol
4. Click 'Confirm' and use the back arrow to navigate back to the main screen.



3b. Connecting battery to PC and using the Pbms Tools software

The battery can be connected to a PC by using the included RS232 to USB cable. This requires a Windows PC (this process has been tested on Windows 7 and above).

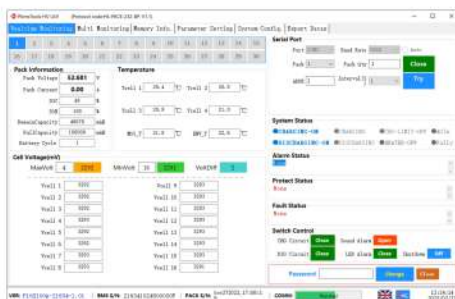
1. On the initial connection to the USB port, Windows will automatically download drivers for the USB to RS232.
2. Download the PBMS BMS monitoring program from our website (you'll find this on the Specification Sheet page).
3. You may be asked to install or update Microsoft .Net Framework, please proceed with this.
4. Open the PBMS Monitoring Tool.



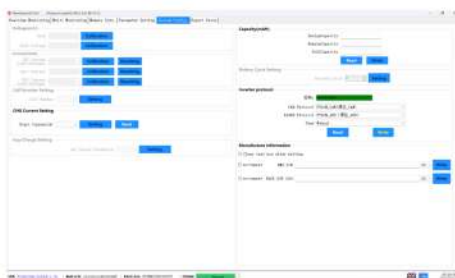
3c. Changing inverter protocol via BMS software

PbmsTools has plenty of powerful features, however we are just focusing on changing the inverter protocol for now.

1. Open the Realtime Monitoring Tab and select click 'OPEN' under the Serial Port section.
2. Select the System Config Tab. Under the Inverter Protocol section, click READ. This will read all inverter protocols currently on the BMS.
3. You can now change CAN and RS485 inverter protocols by selecting which one you require, and then pressing WRITE.
4. The password for writing your chosen inverter is Pz#168178. The password needs to be inputted in the box next to the symbol 密码. The box will turn green when the correct password is inputted.



Open the Realtime Monitoring Tab and select click 'OPEN' under the Serial Port section.



The password for writing your chosen inverter is Pz#168178.



How many rack batteries can I connect together?

You can connect up to 15 Fogstar Energy Racks in parallel.

What protocols does your PACE BMS come loaded with?

The BMS has several pre-loaded inverter protocols with 'out of the box' support for Victron, Pylontech, Growatt, Sofar, Solis and Goodwe. It is crucial to note however, that inverter integration is not required for our server rack batteries to function.

How does the rack communicate with a Victron Multiplus II?

The Multiplus II is supported via a Victron Cerbo GX which will need to be purchased separately.

The batteries connect to a Cerbo GX BMS-CAN port from the CAN port on your main battery. The Cerbo GX then connects to your inverter via a VE.BUS cable. You'll require a type B Victron battery BMS to VE CAN cable for this.

What are the dimensions of the Server Rack Cabinets?

The 3-rack cabinet dimensions are 600 x 625 x 700

The 6-rack cabinet dimensions are 600 x 625 x 1150

These dimensions are without the wheels (which can be removed), the wheels add an additional 100mm to the height.

What size are the Fogstar Server Rack batteries?

The batteries themselves are 3.5U in size, or 450(W) x 160(H) x 440(L) mm in size.

Can I connect my Fogstar Server Rack battery to other makes/models of Server Rack Batteries?

The Fogstar ESR51.2V 5.12KWH systems are not compatible with other types or models of rack battery on the market, this may be due to discrepancies in power/size of the unit, BMS or overall system compatibility.

Please do not attempt to connect your Fogstar Rack Battery to any other make or model of Rack Battery on the market.



Why are you not on the approved list for my chosen Inverter?

We may not be on the approved list for your chosen inverter because we believe that these lists are anti-competitive and limit consumer choice.

Numerous battery approvals lists exist, particularly for popular inverters in the market. At Fogstar, we firmly believe that these lists serve only to restrict the market and reduce consumer options. Our mission is to make lithium batteries affordable and accessible to everyone, and we view approvals lists as a hindrance to progress and innovation across the industry.

Does self-installation void my warranty?

We understand that many people who purchase these racks will be installing them themselves in preparation for system 'sign-off'. This does not affect the warranty at all.

Can my rack battery be mounted on the side?

Yes, you can mount the batteries on their side as part of your installation. However, this approach may make it a bit awkward when reading the battery vitals on the touchscreen.

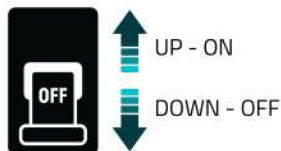
Do you supply Inverter cables?

Supplying these cables is a complex task due to the varying requirements of different inverters and customer setups. Each inverter utilizes unique connectors, and the distance between the inverter and batteries varies for each customer. Additionally, the number of batteries required influences the cable thickness. Consequently, most inverter manufacturers include battery cables as standard accessories.

Should I have received the 35mm cables with my battery?

The 35mm cables are battery to battery cables and only required if you have more than 1 rack battery.

Do I switch the breaker up or down to turn it on/off?



What are the charging parameters of the battery?

Bulk: 57.6

Float: 55.2

Low DC cut off: 43.2





Had a great experience with Fogstar?

We would love to hear your feedback on our Fogstar Energy Rack Battery.

Follow us on Instagram (@FogstarUK), drop us a Google review, get in touch via our customer service team (customerservice@fogstar.co.uk), or leave a product review at our website.



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