



Lithium Series 24V 2.24 kWh Battery

Read this manual before installing the battery and follow the instructions carefully during the installation process.

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1. Scope

This document describes the basic operation of the Turbo Energy brand lithium-ion rechargeable battery (**Lithium Series 24V 2.24 kWh model**). This manual contains all the necessary details for understanding the operation of the equipment and for its correct application.

2. Specifications

Electrical

Nominal capacity	2.23 kWh
Depth Of Discharge (DoD)	90%
Nominal voltage	25.55V
Voltage operating range	23,2 – 28.4V
Cycle life	>= 4500

Physical

Weight	21 kg
Dimensions	400 x 440 x 133 mm
Protection class	IP20
Battery type	NMC

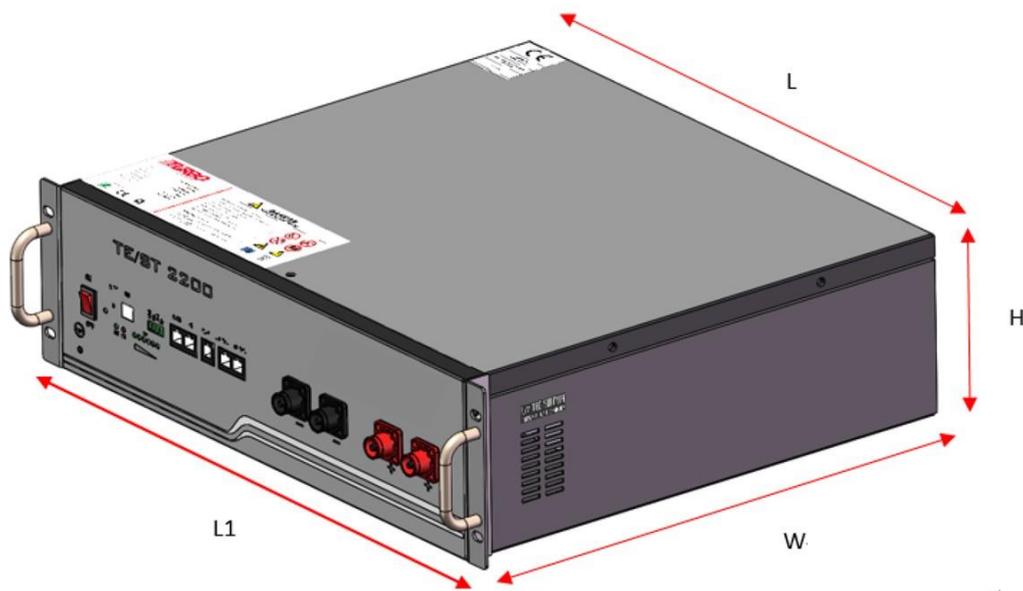
Operation

Maximum charge/discharge current	43,75A (0.5 C)
Temperature operating range (charge)	0°C...40°C
Temperature operating range (discharge)	-10°C...55°C
Humidity	<=80%

BMS

Monitoring parameters	System voltage, cell temperature and voltage
Communication	Compatible CAN y RS-485

3. Battery Dimensions



Width	L= 440mm	L1= 482mm
Depth	W=400mm	
Height	H=133mm (3U)	

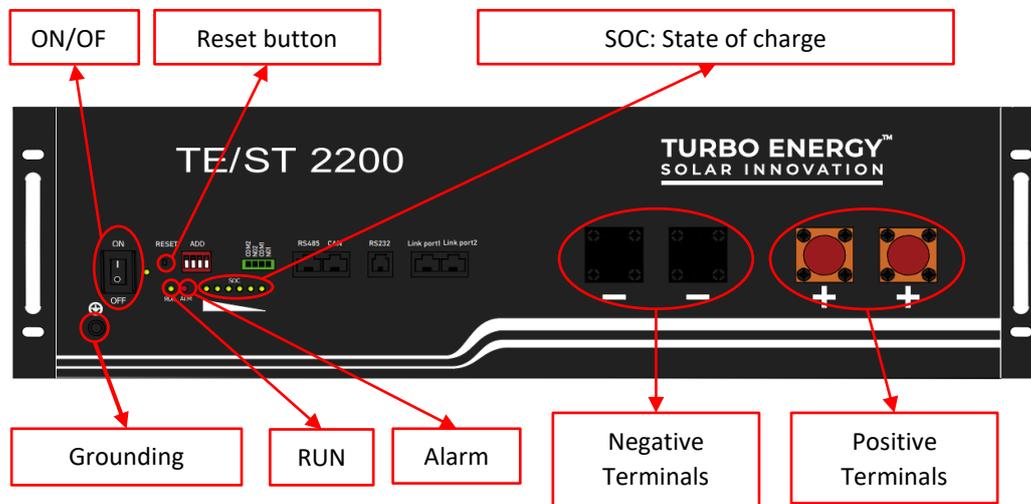
4. Features

The **Lithium Series 24V 2.24 kWh** battery has the following features:

- Designed for use in photovoltaic applications.
- Battery Management System (BMS): The BMS system built into the battery that monitors its operation and does not allow it to work outside the bounds of the design regime (V, I).
- Expandability: The system's accumulation capacity can be expanded by incorporating more batteries.

5. Operation

5.1. Battery front



5.3. Assembly and connection

Batteries may be connected in parallel up to a maximum of 8. All batteries must be grounded. It is suggested to connect the installation ground to the rack at the same point as all battery lands.

Batteries do not require communication to operate efficiently connected in parallel, either between them or between battery and inverter. For proper operation of the batteries, it is sufficient to program the voltage range for the operation with the following parameters.

Operating minimum voltage: 23,2V

Operating maximum voltage: 28,4V

Inverter settings:

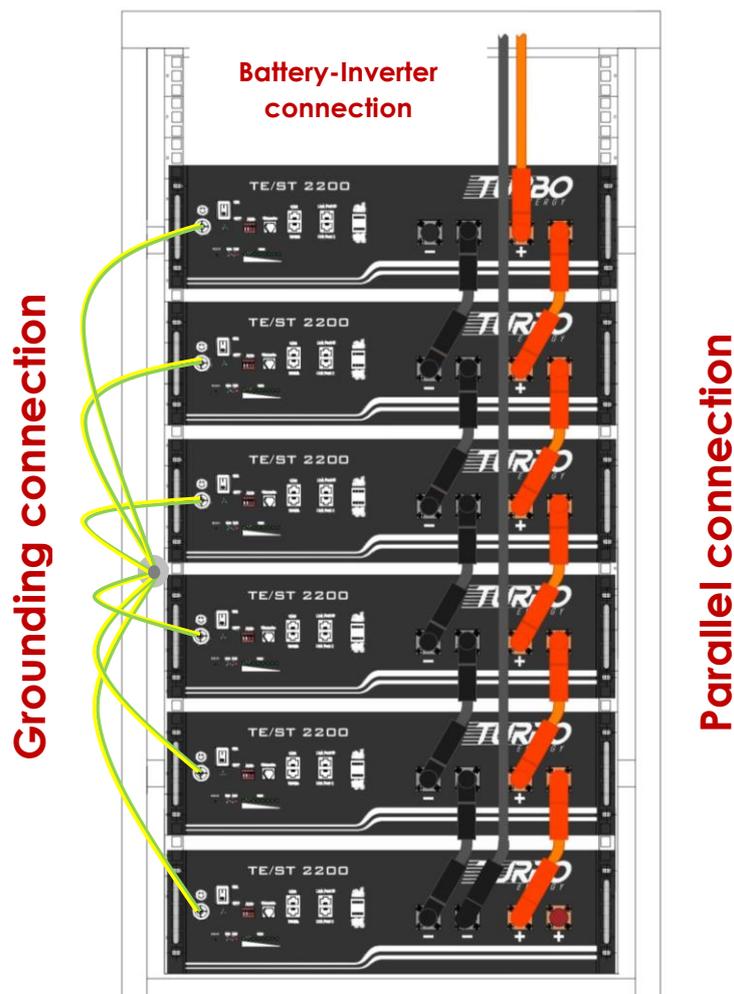
- Charge voltage: 28.2V
- Flotation voltage: 27.2V
- Low battery shutdown voltage: 23.5V
- Charge current per unit: 40A
- Equalization disabled.

Warning when doing a battery expansion: It is very important that in the case of connecting batteries in parallel that are not new (for example, we add a new battery to an existing system), we previously perform a voltage balancing

(without load) between them to avoid overcurrents that could damage the system. As an alternative to balancing voltages, balancing can be done by equalizing the SOC of the batteries. In addition, when connecting new batteries, we must take into account that the number of batteries at the time of connection must be similar to the number of batteries that are already connected in the system. For example, if we have six batteries installed and we want to connect two new ones, we must first connect the two new batteries with one of the six that were already in place to balance them, and then connect these three with the other three remaining batteries in the system. Batteries should always be connected in groups of similar numbers so that a large group cannot damage a smaller group of batteries at the time of connection.

- **Connection between batteries:**

Connect the power cord by plugging the cable into the connectors on the front of the battery.



6.2. *Safety warnings*

1. Do not disassemble the batteries. The inside of the battery has a protective mechanism and a protective circuit to avoid danger. Improper disassembly will damage the protection function permanently, leaving the battery without safety conditions.
2. Never short-circuit the poles of the battery. Avoid contact of positive and negative poles with metals.
3. Keep the batteries away from fire and extreme temperatures. Monitor the distance to thermal bulbs, stoves, etc.
4. Keep the battery away from the water. Always be careful that the battery is not located in damp places where the dew point can be reached.
5. Do not use batteries that have physical damage that may be due to falls or bumps.
6. Do not weld near the battery.
7. Overheating will result in the loss of the protective function of its life cycle, even, it could render the battery useless and in extreme cases self-ignition of the battery occurs.
8. Never connect this battery in series and connect it in parallel only with identical batteries up to a maximum number of 6.
9. If the battery has liquid leakage, avoid contact with it completely. It can be harmful to the skin, and if you touch the eyes, wash, and go to the hospital immediately for treatment.

6.3. *Environmental Protection*

Turbo Energy's batteries comply with EU ROHS regulations.

6.4. *Contact details*

For any incident with the battery write, indicating your contact details, an email to the address: info@turbo-e.com and we will contact you as soon as possible.