



HEAVY DUTY UPS/LITHIUM BATTERY ENERGY STORAGE SYSTEM 7.5 KVA-15 KVA



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INTRODUCTION



Heavy Duty UPS/ Lithium Battery Energy Storage System 7.5 KVA-15 KVA

Investment in your future: Heavy Duty UPS equipped with Lithium Battery Bank also known as Battery Energy Storage Solution (BESS), is an investment in your future. This system can help you save money, be prepared for emergencies and increase the value of your establishment.

How it works: The Energy Storage Solution with Lithium Battery is a simple and easy-to-use system that connects to your home's electrical system. Energy is stored in the lithium battery bank. Then, when you need it, the stored energy can be used to power your establishment.

Why Lithium Batteries Are Better Than Tubular Lead acid Batteries?

Tubular batteries are a type of lead acid battery that is common in solar energy systems. Lithium batteries are a newer type of battery that are becoming increasingly popular due to their several advantages over tubular batteries.

- **Charging time:** Lithium batteries can be charged in as little as 4 hours, as compared to tubular LA batteries which take 15 hours. This makes lithium batteries a better choice for applications where backup power is needed quickly.
- **Cost of charging:** Lithium batteries consume 20-30% less energy during charging, saving you money on electricity bills. Lithium does not draw electricity once fully charged but Tubular battery keeps taking the power after getting 100% charged in the form of trickle charging which is a big wastage of power.
- **Maintenance:** Tubular, Lead acid batteries require regular maintenance, such as water top-up and cleaning. Whereas, lithium batteries are completely maintenance-free.

- **Lifespan:** Lithium batteries have a lifespan of 7-10 years, while tubular batteries have a lifespan of 2-3 years. This means that lithium batteries are a more cost effective option in the long run.
- **Energy density:** Lithium batteries have a much higher energy density than tubular batteries, meaning they can store more energy per unit of weight. This makes them ideal for lithium inverter applications.
- **Operating temperature range:** Lithium batteries can operate in a wider temperature range than tubular batteries. This makes them more versatile & suitable for use in various applications.
- **Economic Benefits:** No water topping, long life and less frequent replacement makes lithium batteries more economical.

Advanced Battery Management System (BMS):

The integrated BMS ensures optimal battery performance, safety, and longevity by controlling each cell equalization.

It has protection for controlling the Lithium battery's Overload, Short circuit, Low battery, and High battery control. In Lithium batteries, the Battery Management System (BMS) can enter into sleep mode to conserve energy. This helps prolong the battery's lifespan by minimizing unnecessary power discharge.

In instances where the battery reaches a critically low level and shuts down, the sleep mode can allow the battery to maintain a minimal charge for an extended period, typically exceeding one month.





Tubular Lead acid Vs Lithium Battery Backup Comparision

Bulb Load vs Battery Ah	96V/150Ah Tubular Battery	9.6kWh Lithium Battery	Weight of tubular Battery: - 520 Kg Weight of Lithium Battery: - 52Kg
2000W	<4 Hours	6:00 Hours	
4000W	<2 Hours	3:00 Hours	
6000W	45 Minutes	95 Minutes	
8000W	20 Minutes	70 Minutes	

Feature	Lithium Battery	Tubular Battery
Maximum Load Capacity	As the Lithium battery is designed to run bigger loads, being a C1 battery.	The Tubular battery is made for smaller loads, being a C20 battery.
Lifespan	7 to 10 years	2-3 years
Charging Time	4 to 5 hours	15 hours
High Voltage, Low Voltage, Overload, Short Circuit Protection	Yes	No
Maintenance	No	High
Equalization of Battery Cells	Yes	No
BMS	Yes	No



Powering India with Cleaner Energy: Replacing Diesel Generators with Lithium-ion Batteries

In a significant step towards curbing air pollution, the National Green Tribunal (NGT) banned the use of diesel generator (DG) sets between from October 2023 in the National Capital Region (NCR) in India. This decision is likely to be followed by other Indian cities grappling with severe air quality issues.

Advantages of Lithium-ion Batteries over DG Sets

- **Zero Switching Time:** At Su-vastika, when the Power comes back, our switching time remains 1 to 3 milliseconds as we change the Load at zero crossing, which is the main reason for our low switching time and the durability of our product range as opposed to diesel generator.
- **Clean Energy Source:** Lithium Batteries do not emit harmful pollutants like carbon dioxide, carbon monoxide, nitrogen oxides, and particulate matter, unlike DG sets that rely on diesel combustion.
- **Noise Reduction & Vibration:** Unlike DG sets that generate significant noise pollution & vibration. Lithium Batteries operate silently, providing a quieter environment.
- **Pure Sine Wave Output:** BESS Produces a pure sine wave, It is essential for sensitive electronic equipment, such as computers, machine load, x-ray machines, CNC machines etc. Whereas, diesel generator produces uneven power quality and its frequency vary significantly. The waveform contains harmonics which damage sensitive equipments.
- **Grid Integration & Renewable Energy Support:** Battery backup systems can be charged from the grid or from solar rooftop photovoltaic (RTPV) systems. While a typical DG set operates only during power outages, a battery energy storage system (BESS) connected to the grid can support the grid 24/7 by providing frequency and voltage regulation. This enhanced grid stability is essential for the integration of solar.
- **Economic Benefits:** While the initial investment in Lithium Batteries may be higher, their lower maintenance costs and extended lifespan lead to significant savings over time.
- **Time of Use (ToU) bill management:** When electricity prices are variable depending on the time of day, storing energy for use during peak hours can reduce power costs. Energy is drawn from the grid to be stored when demand and prices are low and then consumed during peak times when prices are higher would help reduce the overall power bills.

Technology	Diesel Generator	BESS
Noise Emission	50-74 db	Silent
Vibrations	Yes	Nil
Pollutant Emission	2.6 Kg of CO ₂ per Litre of Diesel	Nil
Activation Time Following	30-90 seconds	Instantaneous
Lifetime	10-15 years	Lithium Battery 7-10 years, UPS 20 years
Per KW Running cost	Rs. 29/-	Rs. 8.5/-
Sine Wave Output	With Harmonics	Pure Sine Wave
Applications	Power Back Up	Power Backup, RE Integration, EV Charging, Voltage Regulation

TECHNICAL SPECIFICATIONS

PRODUCT: Heavy Duty UPS IGBT Based (1P-1P)

Technology	DSP Based Technology		
Rating	7.5KVA	10KVA	15KVA

INPUT PARAMETERS

Phases	1 Phase 3-Wire	1 Phase 3-Wire	1 Phase 3-Wire
I/P AC Voltage Range	160VAC-270VAC	160VAC-270VAC	160VAC-270VAC

OUTPUT PARAMETERS

Voltage Regulation	220V ± 2%	220V ± 2%	220V ± 2%
Phase	1 Phase 3-Wire	1 Phase 3-Wire	1 Phase 3-Wire
Frequency regulation	50Hz ± 0.1Hz	50Hz ± 0.1Hz	50Hz ± 0.1Hz
Output Waveform	Pure Sine Wave	Pure Sine Wave	Pure Sine Wave
Load Power Factor	0.8 lag to unity	0.8 lag to unity	0.8 lag to unity
Total Harmonic Distortion (Resistive Load)	≤5 %	≤5 %	≤5 %
Crest Factor	≥3:1	≥3:1	≥3:1
Full Load	6KW	8KW	12KW

BATTERY PARAMETERS

Type of Batteries	Lithium Batteries	Lithium Batteries	Lithium Batteries
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USER INTERFACE

Remote Monitoring (Optional)	Wi-Fi/Bluetooth with Application (iOS & Android)
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OTHERS

Indication	LCD panel	LCD panel	LCD panel
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Smart Heavy Duty UPS with Bluetooth & Wifi enabled Mobile applications

Real-Time Digital Warranty of UPS



Backup mode

Short circuit protection message along with actionable advisory

Overload protection message along with actionable advisory

3 Years Digital Warranty



Heavy Duty UPS (Energy Storage System) comes with 3 years warranty

A Smart and Convenient Paperless Warranty Solution:

Su-vastika's Digital Warranty aligns with the actual usage of the Inverter. The warranty period starts only when the Inverter is connected to the Battery and pauses when the Battery is disconnected. This intelligent system ensures that warranty coverage is accurately tailored to the product's usage cycle.

Heavy Duty UPS (Energy Storage System) is a Bluetooth enabled device that shows you the real-time digital warranty of UPS.

Solar Compatible

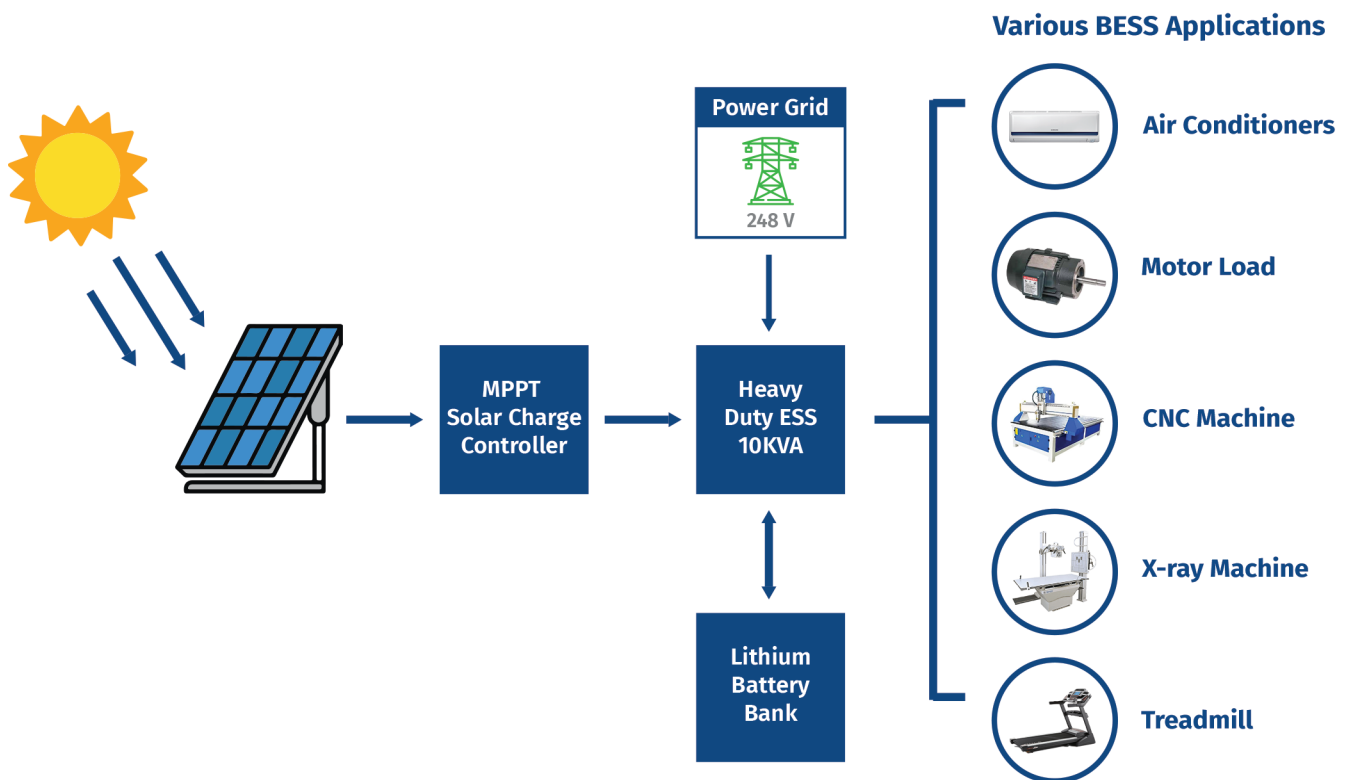
ESS by Su-vastika also comes with a Solar feature allowing batteries to be charged using solar power. This way the cost of the system can be recovered in just 2-3 years, since the cost of power generation using Solar Panels is very low and they also last up to 25 years, which will further reduce the running costs.

Solar-based ESS can be installed in various places where there is space for solar panels and solar power can be properly utilized.

Even if power is available on the grid, the solar-based system will be able to run by leveraging the solar and battery power (when available) which will again save the cost of electricity.

ESS & Solar Charge Controller Configuration

The total components and subsystems that work in combination to convert solar energy into electrical energy suitable for connection to a utilization of load.



Models	Battery Bank	Solar Charge Controller	Solar Panels
7.5KVA	8kWh	5.5KW	5.5KW
10KVA	10kWh	5.5KW	5.5KW
10KVA	20kWh	10KW	10KW
15KVA	20kWh	10KW	10KW

Comprehensive Protection Features

- **Overload Protection:** Shields against excessive power demands.
- **Short-Circuit Protection:** Safeguards the battery and connected devices from short circuits.
- **Battery Management System (BMS):** It monitors, manages, and protects the performance and lifespan of the battery.
- **Reduced Charging Cost:** Since charging time of ESS is 1/4th that of a lead acid battery, it uses less electricity than traditional inverter by at least 20%.
- **Isolation Transformer:** UPS with Isolation transformer provides efficient, high quality, and safe power solutions under imperfect power situations like frequent fluctuations in voltages.
- **Fast switching:** It switches to backup mode in uninterruptedly. Devices like computer, Wi-Fi, printers, Air Conditioners, Treadmill, X-ray machines etc and other critical equipment can run uninterrupted.
- **Safe Voltage Range:** It is important to keep appliances safe during high & low voltage input.
- **Soft Start:** This feature provides a cushioned start-up. It gradually increases the voltage to let your appliances restart smoothly, and they don't get any high voltage jerk during switching which happens in case of generators.





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