SATETY MANUAL

FOR LITHIUM BATTERY

1. **INTRODUCTION**

This safety manual is designed to provide guidelines for the safe installation, handling, operation, storage, usage and maintenance of the Lithium battery. It is essential to follow these instructions to prevent accidents, injuries, electric shocks, or damage to the battery. Please read and follow all instructions carefully.

2. **GENERAL SAFETY PRECAUTIONS**

2.1 Only use the battery for its intended purpose.
2.2 Do not disassemble, crush, puncture, or expose the battery to high temperatures.
2.3 Keep the battery away from water, moisture, and heat sources.
2.4 DO NOT OPEN/TAMPER THE BATTERY.
2.5 Do not short-circuit the battery terminals.
2.6 Avoid exposing the battery to direct sunlight for extended periods.
2.7 **KEEP A CLASS D FIRE EXTINGUISHER NEARBY.** Do not use water to extinguish a battery fire.





3. **INSTALLATION**

3.1 Ensure that a qualified electrician makes all electrical connections and follows; store all local electrical codes and standards.
3.2 When handling the battery, wear appropriate PPE such as gloves, safety glasses, and protective clothing.
3.3 Secure the battery to a stable, non-combustible surface. Please make sure it is adequately supported to prevent tipping.
3.4 Use appropriate cables and connectors for electrical connections. Double-check all connections for tightness and correctness.
3.5 Properly ground the battery system according to local electrical codes.

3.6 COPPER WIRE EARTHING IS ESSENTIAL FOR SAFETY. VOLTAGE BETWEEN NEUTRAL AND EARTH SHOULD BE LESS THAN 5VOLT. THIS HELPS DISSIPATE ANY POTENTIAL LEAKAGE CURRENT AND MINIMIZES ELECTRICAL HAZARDS.

3.7 The Miniature Circuit Breaker (MCB) for the input power supply should be located near the ESS for easy access and control.

3.8 In a 3-phase system, the electrical load should be evenly distributed across all three phases. This ensures efficient operation of the ESS and avoids overloading any single phase.

3.9 Confirm that the phase sequence of the incoming power supply matches the output from the ESS. Incorrect phase sequence can damage equipment.

3.10 Lithium Battery bank terminals must be isolated from electrical wiring and other objects and should not be short-circuited; otherwise, they can cause sparks and fire.

3.11 Rats can be a big risk, as they might damage the wires, which can cause a short circuit of the battery.

4. CHARGING

4.1 **USE ONLY SU-VASTIKA DEFINED UPS/CHARGER RATING SYSTEM. DO NOT USE ANY OTHER BATTERY AND INVERTER, without information from manufacturer.**

4.2 Do not overcharge or undercharge the battery.

4.3 Monitor the battery during charging and disconnect it once fully charged.

4.4 Do not charge the battery near flammable materials.

5. STORAGE

5.1 Store the battery in a cool, clean, dry place away from direct sunlight and heat sources.

5.2 Keep the battery and surrounding area clean and free of dust and debris. Use a dry cloth for cleaning.

5.3 Do not store the battery fully charged or fully discharged for extended periods.

5.4 Keep the battery away from children and pets.

5.5 Inspect the battery regularly for any signs of damage or swelling.

5.6 Lithium batteries should be kept in a cool and dry environment, with a minimum temperature of 40°C (104°F) and optimally around 30°C (86°F) to maximize battery life.

5.7 Do not keep Lithium Battery near outdoor unit of Air conditioner.

5.8 ENSURE ADEQUATE VENTILATION TO PREVENT THE BUILDUP OF HAZARDOUS GASES.

6. HANDLING AND TRANSPORT

6.1 Handle the battery carefully to avoid dropping or impacting it.

6.2 Use appropriate protective gear when handling the battery.

6.3 Transport the battery in a secure and stable manner to prevent damage.

6.4 Do not expose the battery to extreme temperatures during transport.

7. **INSPECTION**

7.1 Regularly inspect the battery for any signs of damage, leaks, or swelling. If in doubt about the battery's condition, contact the manufacturer for guidance.

8. **EMERGENCY PROCEDURES**

8.1 IN CASE OF ELECTROLYTE LEAKAGE, SWELLING OF BATTERY, FIRE OR THERMAL RUNAWAY, EVACUATE THE AREA AND CONTACT EMERGENCY SERVICES IMMEDIATELY.

8.2 Use appropriate fire extinguishing equipment for lithium-ion battery fires.

8.3 Use Class D Fire Extinguisher to extinguish a battery fire. Do not attempt to extinguish a battery fire with water.

8.4 IN CASE ANY ABNORMALITY FOUND WITH BATTERY, IMMEDIATELY TURN DOWN MAIN INPUT SUPPLY MCB AND THEN BATTERY MCB.

8.5 If someone receives an electric shock, immediately disconnect power, and seek medical assistance.

9. **DISPOSAL**

9.1 Do not dispose of the battery in regular household waste.

9.2 Follow local regulations for the proper disposal of lithium-ion batteries.

9.3 Consider recycling options for the battery to minimize environmental impact.

9.4 Contact authorised recycling facilities for proper disposal. Lithium-ion batteries are recyclable and should be handled according to local environmental regulations.

10. **DISCLAIMER**

10.1 The information provided in this safety manual is intended as a general guideline for the safe handling of the Lithium-ion battery. The user is responsible for following all safety precautions and guidelines provided by the manufacturer.

10.2 Please ensure to adapt and expand upon this safety manual as needed to meet the specific requirements of your application or industry.

10.3 It's crucial to prioritize safety when dealing with high-capacity lithium-ion batteries to prevent accidents and ensure safe operation.

11. **CONTACT INFORMATION**

For further information or assistance, please contact:

Su-vastika Customer Support

- **Phone**: 9711774744, 18002024423
- **Email**: info@suvastika.com
- **Address**: Ghamroj, Near Toll Plaza, Sohna Road, Gurgaon-122102
- **Website**: www.suvastika.com

SITE REQUIREMENT
FOR 3 PHASE SYSTEM WITH LITHIUM BATTERIES
(Customer Responsibility)

Location:

1. **Covered and Ventilated Room:** The ESS should be installed in a dedicated room with proper ventilation prevent overheating of the batteries.
2. **Insulated Rooftop:** The room should have an insulated rooftop to minimize heat gain from direct sunlight.
3. **No Roof Installation:** Ideally, avoid installing the ESS directly on the roof due to extreme temperature variations. If roof installation is unavoidable, an air conditioner becomes mandatory to maintain the proper temperature range.

Electrical Considerations:

4. **Copper Earthing:** Proper earthing with copper is essential for safety. This helps dissipate any potential leakage current and minimizes electrical hazards. Min one Earthing of min 16 sqmm required for system up-to 50 KVA. Min two Earthing of min 25sqmm required for system above 50 KVA.
5. **Foundation:** A 4-inch foundation needs to be built at the basement and terrace, likely to support the weight of the ESS unit.
6. **Input MCB Placement:** The Miniature Circuit Breaker (MCB) for the input power supply should be located near the ESS for easy access and control.
7. **Balanced Load:** In a 3-phase system, the electrical load should be evenly distributed across all three phases. This ensures efficient operation of the ESS and avoids overloading any single phase.
8. **Phase Sequence Verification:** Confirm that the phase sequence of the incoming power supply matches the output from the ESS. Incorrect phase sequence can damage equipment.
9. **Cable Length Limitations:** The distance between the ESS unit, battery bank, and distribution box (DB) should be within specified limits (2 meters for ESS-battery, 4-5 meters for ESS-DB). Longer cable runs might require adjustments or additional costs.
10. **Input/Output Cabling:** The cost of cables connecting the ESS to the distribution box is not included and will be charged extra if needed.
11. **Electrical Room Readiness:** The room designated for the ESS installation should be prepared beforehand. This includes having a finished floor and being cleared of any construction materials.

Additional Safety Considerations:

1. Lithium batteries should not be exposed to direct sunlight, heat, or rain.
2. Lithium batteries should be kept in a cool and dry environment, with a minimum temperature of 40°C (104°F) and optimally around 30°C (86°F) to maximize battery life.
3. An exhaust fan is mandatory to ensure proper air circulation and prevent overheating.
4. The ESS should be placed in a covered, ventilated room with an insulated rooftop.
5. Avoid installing it directly on the roof. If roof installation is unavoidable, an air conditioner is mandatory to maintain the proper temperature range.
6. Prevent dust buildup that can block the fan and hinder ventilation.
7. Turn down Battery MCB if UPS is disconnected or faulty to avoid battery going into Deep discharge.
8. Do not open/tamper the battery.

THE WARRANTY WILL LIKELY BE VOID IF THE ABOVE SAFETY MEASURES ARE NOT FOLLOWED. THIS IS BECAUSE IMPROPER STORAGE AND HANDLING CAN DAMAGE THE BATTERY AND LEAD TO MALFUNCTIONS