# SOLAR POWER GENERATOR UNIT

## USER MANUAL

## COVERING

## SPG500W AND SPG1000W

## Dear Customer,

Thank you for choosing our solar power generator (SPG).

This user manual contains explanations on using the SPG. You will learn to recognize the many possibilities of the SPG. Information is provided on safety and installation. Please observe the safety precautions exactly to ensure increased safety at the operating site of the SPG.

**WARNING!** Before installation of the SPG, read and save these safety instructions.

## Important Safety Instructions:

IMPORTANT: READ AND SAVE THIS OWNER'S GUIDE FOR FUTURE REFERENCE. This chapter contains important safety and installation instructions for the SPG. Each time, before using the SPG, READ ALL instructions and cautionary markings on or provided with the SPG and all appropriate sections of this guide

Safety Precautions to be followed while Installation, Operation & Maintenance for the SPG as High voltage is present inside unit. Incorrect installation or use may result in risk of electric shock or fire. No user serviceable parts in this unit.

- Do not expose the SPG to rain, snow, spray, or bilge water. This SPG is designed for indoor use only.

- Do not operate the SPG if it has received a sharp blow, been dropped, has cracks or openings in the enclosure including if the fuse cover has been lost, damaged, or will not close, or otherwise damaged in any other way.

- Do not disassemble the SPG. Internal capacitors remain charged after all power is disconnected.

- Disconnect both AC and DC power from the SPG before attempting any maintenance or cleaning or working on any circuits connected to the SPG. See note below.
- Do not operate the SPG with damaged or substandard wiring. Make sure that all wiring is in good

Condition and is not undersized.

ELECTRICAL SHOCK HAZARD

**DANGER**

STATEMENT OF HAZARDS:-

Contains statements of avoidance or Strict Compliance. Failure to follow these Instructions will result in death or serious Injury.

Failure to follow these instructions will result in death or serious injury

NOTE: Turning off the SPG using the on/off switch on the front panel will not reduce an electrical shock hazard.

FIRE AND BURN HAZARD

- Do not cover or obstruct the air intake vent openings and/or install in a zero-clearance compartment.
- Do not use transformer less battery chargers in conjunction with the SPG due to overheating.

Failure to follow these instructions will result in death or serious injury

EXPLOSION HAZARD

- Charge only properly rated (such as 12V/24V) lead-acid (GEL, AGM, Flooded,) rechargeable batteries because other battery types may explode and burst.
- Do not work in the vicinity of lead-acid batteries. Batteries generate explosive gases during normal operation. See note #1.
- Do not install and/or operate in compartments containing flammable materials or in locations that require ignition-protected equipment.
- Failure to follow these instructions will result in death or serious

**NOTES:**

1. Follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review cautionary markings on these products and on the engine.

2. This SPG contains components which tend to produce arcs or sparks.

3. Locations include any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system

## Precautions When Working With Batteries

**WARNING**

## NOTES:

1. Locate the SPG unit away from batteries in a well-ventilated compartment.

2. Always have someone within range of your voice or close enough to come to your aid when you work near a lead-acid battery.

3. Always have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.

4. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flood it with running cold water for at least twenty minutes and get medical attention immediately.

5. Use extra caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.

6. Batteries can produce a short circuit current high enough to weld a ring or metal bracelet or like to the battery terminal, causing a severe burn.

7. When removing a battery, always remove the negative terminal from the battery first for systems with grounded negative. If it is grounded positive, remove the positive terminal first. Make sure all loads connected to the battery and all accessories are off so you don't cause an arc.

## Maintenance and Service:

- To reduce risks of electric shock, disconnect all wiring before cleaning.
  Always maintain caution during maintenance & service.
- Even after the unit is disconnected from the Solar Panel / mains power supply (building wiring socket outlet), components inside the SPG system are still connected to the battery and are still electrically live and dangerous.
- Before carrying out any kind of servicing and/or maintenance, disconnect the battery and verify that no current is present.

**CAUTION**

**RISK OF DAMAGE TO THE SPG**

- Never allow battery acid to drip on the SPG when reading gravity, or filling battery.
- Never place the SPG unit directly above batteries; gases from a battery will corrode and damage the SPG.
- Do not place a battery on top of the SPG. Failure to follow these instructions can damage the unit and/or Damage other equipment.

## Installation:

Overview of Installation Steps

- Mount the SPG.
- Connect the DC cables (Battery).
- Connect the SPV cables (Solar).
- Connect the AC cables (Mains).

**Mount the SPG**

1. Make sure that the SPG's switch is in the center position.
2. Select an appropriate mounting location and orientation. The SPG must be oriented in under a horizontal surface.
3. Don't connect the AC input cable before connecting the battery cable.

## Connecting the DC Cables

### DAMAGE FROM A REVERSE POLARITY CONNECTION

- DC power connections to the SPG must be positive to positive and negative to negative.
- A **reverse polarity connection** (connecting positive to negative) can cause permanent damage to the SPG. Damage caused by a reverse polarity connection is not covered by the warranty.

**Failure to follow these instructions can damage the unit and/or damage other equipment.**

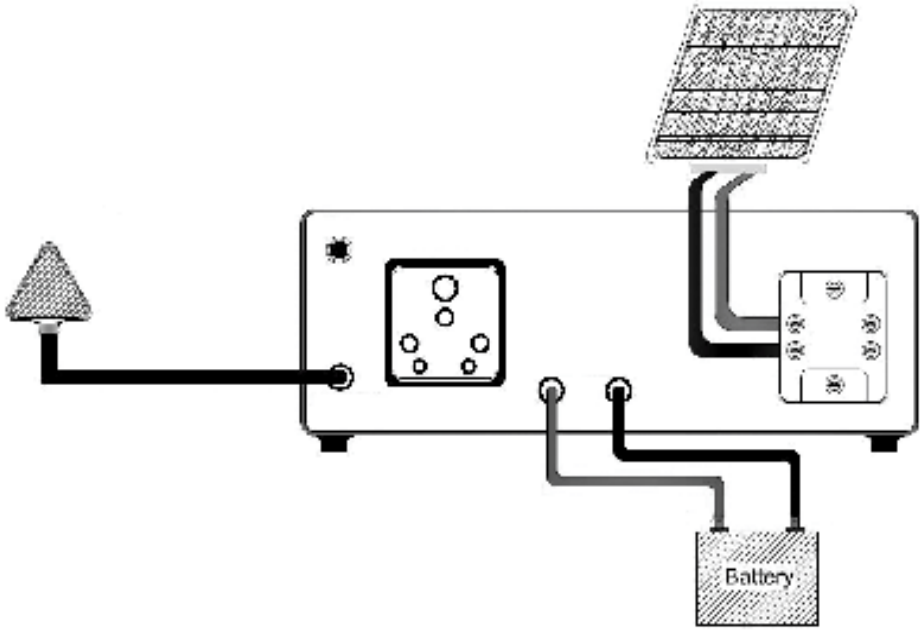
- Make sure the SPG's ON/OFF switch is in the centre position.
- SPG's positive [**RED**] DC Cable to properly connected **positive terminal of the battery**.
- SPG's Negative [**Black**] DC Cable to properly connected **Negative terminal of the battery**.
- Do not install SPG near flammable materials like plywood, chemicals, gasoline, etc.
- Always ensure you connect the SPG system to an earthed shockproof socket outlet.
- Ensure proper Tools / connections for Solar Input to SPG and AC Output from SPG.
- Please make sure the battery inter connections (Series Parallel in case of need) were done Properly as per system voltage requirement.
- Connect the Battery, Solar Panel and AC mains as per the instruction given in Pic Rear View.
- Please make sure the switch in the front panel was in Centre position.
- Connect Battery terminals with battery by ensuring correct polarity (Wrong Polarity connection will lead to permanent failure of the product)
- Connect PV Terminals with solar panel by ensuring correct polarity (Wrong Polarity connection will lead to permanent failure of the product)
- Connect the loads with SPG with Output Socket provided for AC Output, Kindly make sure the AC socket used to draw AC power suits the existing AC socket and free from damage.

Switch on the SPG by operating switch in front panel to SPG Mode and ensure the Display as in Pic 1.

Isometric View

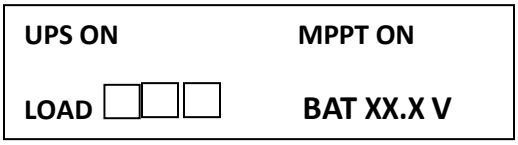
Picture: 1

Connect AC Mains cable with AC Grid source and ensure the display as in Pic 2 and please do not feed the output of the SPG as the input to SPG again as it will lead to malfunction of the unit.




Picture: 2

## DISPLAY PANEL:





Message -1 Message - 2

XX.X V INDICATES THE BATTERY VOLTAGE LEVEL AS PER ACTUAL.

**Operation:**

- Do not disconnect Solar Panel Input cable / mains cable of the SPG system and also the power socket outlet during operations since this would nullify the grounding of SPG system and all connected loads.
- The SPG has its own internal power source (batteries). The output terminals may be electrically live even when the SPG is not connected to the Solar Panel / AC supply. Hence handle with caution.
- In case of any Error observed please note down the error code which will get generated and displayed in front panel display which will help the service engineers for a quick fix.

**Technical Specification:**

| **PRODUCT NAME** | **SPG500W** | **SPG1000W** |
|---|---|---|
| Rated Power | 500W/650VA | 1000W/1250VA |

**INPUT**

| | |
|---|---|
| Selectable Voltage & Frequency Range | 170-250 VAC(For UPS mode) 49-60Hz ± 1% |
| | 110-250VAC(For Inverter mode) 49-60Hz ± 1% |

**OUTPUT**

| | |
|---|---|
| System Output Condition | When the battery is fully charged, System output will be automatically change over to UPS / INVERTER mode, and resume back to bypass mode only by 11.5 V±0.2 V / 23±0.2V of battery voltage when solar is available |
| Display | Battery Voltage, Load Level, UPS ON, Mains ON, MPPT ON / Solar ON, Battery Full |
| AC Voltage Regulation | 230VAC + - 5% 50Hz ± 1% |
| Protection & Surge Power | Over Load, Over Charge, Phase Reversal, Over Temperature and Surge;<br>i. Operating safely for at least one minute at 125% of rated power.<br>ii. Operating safely for at least ten seconds at 150 % of rated power.<br>iii. Operating safely for at least five second at 200% of rated power. |
| Efficiency (Peak ) | 85% |
| Transfer Time | 15 ms (For UPS mode ) |
| | 40ms ( for Inverter mode ) |
| Waveform | Pure Sine Wave |

**BATTERY & AC CHARGER**

| | | |
|---|---|---|
| Battery Voltage | 12VDC | 24VDC |
| Battery LVD Cut off | 10.8 ± 0.2V | 21.6V ± 0.2V |
| Load Reconnection | 12.6V ± 0.2V | 25.2V ± 0.2V |
| Maximum Charge Current | 2A to 12A Auto programmed | |

**MPPT SOLAR CHARGER**

| | | |
|---|---|---|
| Operating Voltage | 18VDC -55VDC | 38VDC -66VDC |
| Maximum PV Array Open Circuit Voltage | 85VDC | |
| Maximum Charging Current | 30A | 40A |
| Maximum Efficiency | 97% | |
| Standby Power Consumption | 6W | |

**PHYSICAL**

| | |
|---|---|
| Dimension H X W X L (mm ) | 120 x 280 x 380 |
| Net Weight (kgs ) | 7.5 |
| Operating temperature | 0 C - 55 C |
| Enclosure Rating | IP20 |

**NOTE: Because of EMIIT's policy of continuous product improvement, the specifications are subject to change without notice.**