



# SOLAR PROMAX

Making Your **DREAMS** Come True **24/7**



## EASTMAN SOLAR PROMAX SERIES

User manual

SOLAR PROMAX 500VA, 1000VA, 1500VA & 2000VA

# About This Manual

## PURPOSE

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

## Do's and Don'ts

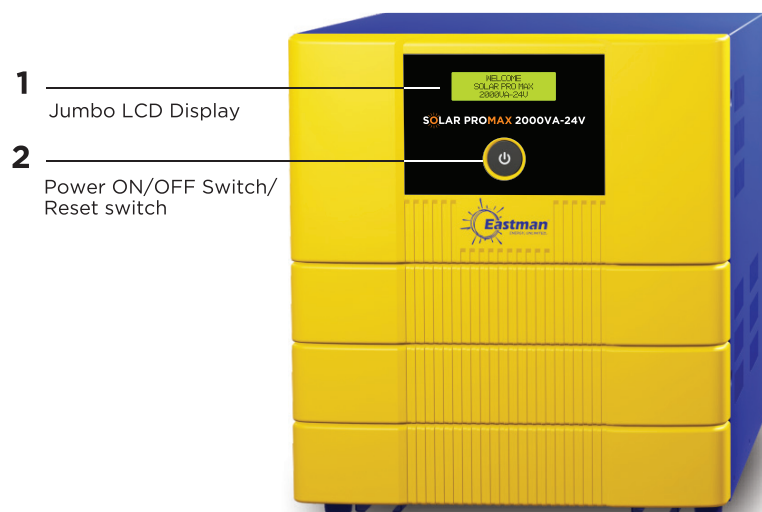


1. Check the battery polarity & connect the product accordingly:  
Connect black wire to the -ve terminal of the battery.  
Connect red wire to the +ve terminal of the battery.
2. First connect the battery to the product. Only after that connect the product with solar & mains.
3. Ensure no reptiles like Mouse, lizards in the PCU room.
4. Heavy power load should be bypassed from product connection. Fit all connections tightly.
5. Check the solar polarity, recommended Number of solar panels and measure Voc then connect to the product accordingly.
6. Connect solar Pink wire with (PV+) and Blue wire with (PV-) on the solar HT terminal.
7. Fit all connections tightly.
8. Install the product in covered space with proper ventilation and keep one foot gap between back of product and wall or any obstruction.
9. Use proper and standard plugs for connections.
10. Product and battery should be kept in a trolley and dry place.
11. Always use the recommended battery Ah and number of batteries.
12. Ensure all vents of the connected battery are not obstructed.
13. Please contact the authorized service person in case of any issue in the product.
14. Disconnect Solar, Mains & battery connection before servicing.



1. Never connect product to battery without checking correct polarity of battery wires from the product & battery terminals.
2. Never connect electricity (mains) or Solar without connecting the battery with the product.
3. The room should not be heated for PCU and battery.
4. Never connect all the load with the product.
5. Never connect solar without checking solar VOC.
6. Never connect the product to the solar without checking the polarity of the solar panel wire and product HT (solar terminal block).
7. Never leave the loose connections.
8. Never install the product under the sky, in tight space, near a water tank or kitchen.
9. Never use loose or nonstandard plugs for connections.
10. Never place product and battery on floor and dusty.
11. Never use an un-recommended battery.
12. Never block the vents of the connected battery.
13. Do not try to open or repair the product on your own as it may electrocute.
14. Do not use any liquid or detergent powder for cleaning the product.

## Front Panel Description



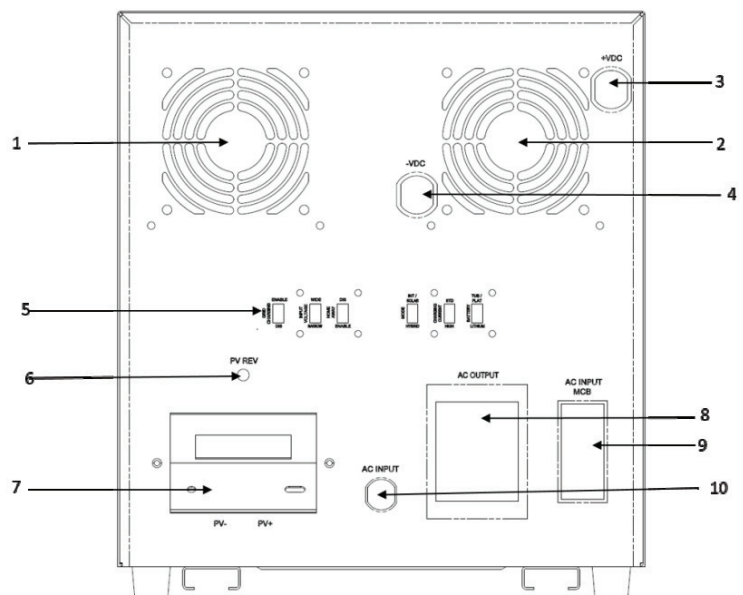
# LCD Display Indication

<p><b>I. POWER SWITCH INDICATION</b> Indicate Power Switch is ON or OFF.</p> <p><b>II. POWER ON/OFF AND RESET SWITCH</b> i) When switch is OFF backup mode is inactive, Mains bypass and Charging is active. Buzzer is muted. ii) Switch ON : All functions of product works. iii) Switch Reset: Reset the system from all fault conditions</p>	
<p><b>III. Jumbo LCD Display Indications</b></p>	
<p>Welcome Message</p>	<p>“Welcome to SolarPro Max” Initialising....SolarPro Max Initialising....S/W Version 1.1</p>
<p>PCU ON</p>	<p>Battery Volt=...V CHG Current=...A PV Volt=...V PV Current=...A O/P Volt=...V O/P Freq.=...Hz PV Pow=..... Load%=... Total Power GEN=...WH Total Power GEN=...KWH Total Power GEN=...MWH Total Power GEN=...Unit</p>
<p>Mains ON</p>	<p>Grid Volt=...V Grid Freq.=...Hz O/P Volt=...V O/P Freq.=...Hz</p>
<p>Battery Indication</p>	<p>Battery High • Plz Check Battery Low Battery • Plz Reduce Load</p>
<p>Overload Indication</p>	<p>Overload • Plz Reduce Load</p>
<p>Fault Indication</p>	<p>i. Short Circuit • Plz Check Load ii. Over Temp. • Plz Check Venti. iii. MCB Trip • Plz Reset MCB iv. PV Power High • Plz Reduce Panel v. PV Voltage Low vi. PV Voltage High vii. Grid High viii. Grid Low</p>

Battery Mode	<ul style="list-style-type: none"> <li>• Li-ion</li> <li>• Tubular</li> <li>• Flat</li> </ul>
Mode	<ul style="list-style-type: none"> <li>• Mode Intelligent</li> <li>• Mode Hybrid</li> <li>• Mode Solar</li> </ul>
Backup Mode ON	Grid Absent
Backup Mode OFF	Grid Bypass

## Back Panel Description

1. DC Fan 1
2. DC Fan 2
3. Positive(+) Battery Lead
4. Negative(-) Battery Lead
5. SLIDE SWITCH FUNCTIONS
  - Grid Charging(Enable/Disable)
  - Input Voltage(Wide/Narrow)
  - Home Away(Enable/Disable)
  - Mode(Intelligent/Hybrid/Solar)
  - Charging Current(STD/High)
  - Battery(Lithium/Tubular/Flat)
6. SPV Rev.
7. Solar HT (PV-,PV+)
8. AC Output Socket
9. AC Input MCB
10. AC Input



## Battery & Solar Panel Installation & Connections

CAUTIONS: Battery/Solar polarity must be checked before connections. Wrong polarity connections with PCU will cause Reverse Protection Fuse Blown and may lead to fire hazards.

### Installation shall be done by a knowledgeable person

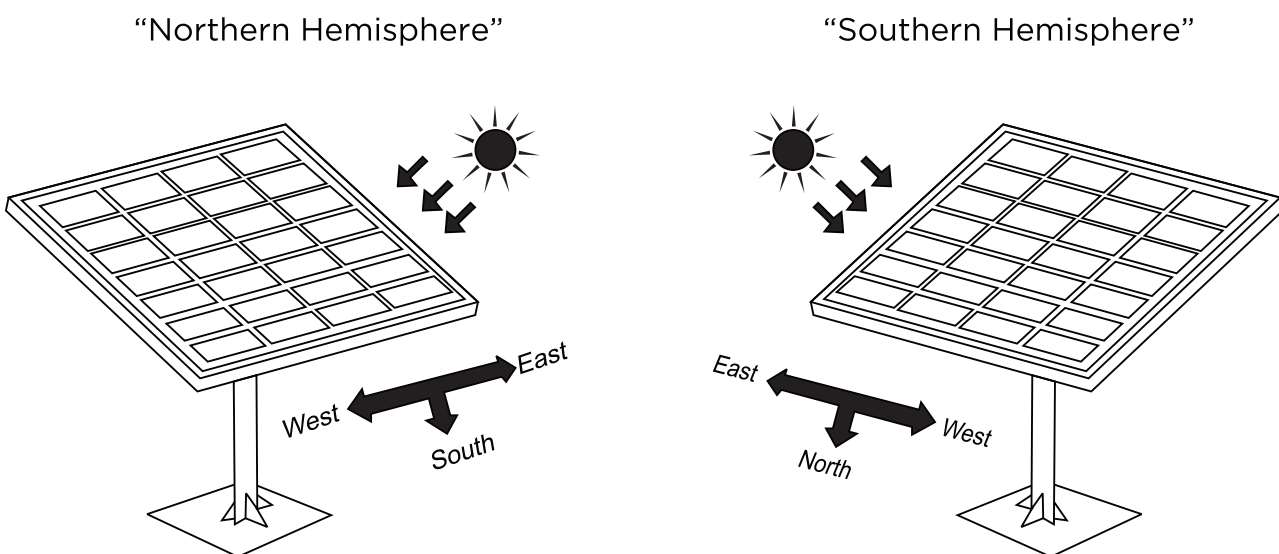
Take Precaution while connecting the thimble of Battery cable to battery post, avoid short circuit by Spanner etc.

# Steps for PCU Installation

To be done by an authorized service person

- Switch off the supply to the distribution point to which the PCU unit to be connected.
- For extra safety also remove the fuses from the line. Make sure with measurement that there is no power.
- A readily accessible disconnect device must be incorporated in all fixed input wiring. The disconnect device shall have a contact separation of at least 3mm. The PCU has automatic back feed isolation but for extra safety a warning label can be added on the primary power isolator installed remote from the PCU to warn electrical maintenance.
- Check the building wiring, improper wiring will not prevent the PCU from operating but will limit its protection capabilities. Improper building wiring could result in equipment damaged that is not covered in warranty.
- Connect the battery/ batteries to PCU as per its requirement.
- Keep the front switch of PCU on OFF Position.
- Measure Voc which is coming from the solar panel, it should be within range which is mentioned in the technical specification.
- Connect solar wires to the system according to marking (Polarity check) on the rear panel of the system.
- Connect the Load wire to the right hole of the output socket located on the rear panel of PCU.
- Switch on the front switch of the PCU.
- Connect AC input wire to commercial mains Socket.

## Recommended solar panel mounting orientation Panel stand mounting pole



# Important

In the event of any instrument requiring service at our authorized service centre, the following procedure should be adopted:-

1. The instrument must be securely packed, preferably in its original packing. Also ensure that nothing inside packing is damaged. Please transport the product in its original packaging to protect against shock, damage & impact.
2. We reserve the right to charge the consignee for any damages incurred during transit.
3. The output of the PCU should never be connected to a generator or incoming utility power source.
4. This situation is far worse than a short circuit. If the unit survives the condition, it will shut down until correction is made.

# Features

- State of art technology using High End DSPIC for optimized performance and reliability.
- High-end DSPIC based High Resolution PWM technology using MOSFET: High-end DSPIC used where the internal digital frequency control is at a speed of as high as 100 MIPS (Million instruction per second).
- ACEC (Analog Compare error correction) technology based PWM for the generation of pure SINE WAVE: Using ACEC technology the PWM is corrected.
- Boost based PWM controlled intelligent multistage Battery Management charging technology, the input power factor maintains 0.85 which reduces the electricity bills.
- Wiring fault, overload, short circuit, battery low, reverse phase, reverse battery, solar reverse, solar low, and solar high protections.
- ASC (Assessing system configuration) software technique is being incorporated. The software verifies all the critical system parameters before the system starts & keep on assessing the system parameter while the system is running.
- Deliver unmatched noise free performance.
- Narrow Mode: Especially useful with computer type of application, music studio or medical equipment etc.
- CBT (Control Battery Temperature) technique is our innovation, with the help of this technique the battery temperature never exceeds the standard limit of the temperature inside the battery.
- REPLICATES MAINS: Ensure same power quality as from mains with a crest factor of as high as 3:1.
- Customer friendly Jumbo LCD display.
- PLPO: Peak Load Peak Output ensures high peak load handling capacity.
- Generator compatible.
- Static changeover by using SCR module improves life and reliability and reduces the change over time, change over time is 10ms.
- Special output with TDR (Time Delay Relay) for smooth running of compressor type load like Air Conditioner, Deep freezers etc.

- Solar Tracking efficiency above 98%.
- All over system Tested by Chroma Simulator.
- Fast response MPPT charge controller.
- Power generation calculation.
- Three working modes:- Solar, Intelligent, Hybrid.
- Three battery selections:- Tubular, Lithium, Flat.
- Lithium compatible.
- Revive battery by Solar & Grid.
- Isolated GPRS/GSM, Bluetooth, RS485, Online monitoring.

## Troubleshooting

<b>Problem</b>	<b>Possible Caused / Action Suggested</b>
1. Main supply is normal but:- a) PCU is working on battery	a) Check the AC mains presence in the mains AC wall terminal. b) Check the AC mains input voltage, it should be in the range of 90Vac to 290Vac when selected mode is wide & 170Vac to 270Vac in narrow mode.
b) Or no output from PCU	Check the MCB/circuit breaker at the rear panel. If tripped, push the MCB/circuit breaker (reset) to switch on the mains, if again tripped then call the authorized service engineer.
2. PCU trips frequently in NARROW mode.	The load might be more. Reduce the load and reset the PCU.
3. PCU mode but no power :- a. Overload (overload in display) b. Low battery (low battery in display) c. Short circuit (overload/short-circuit in display)	a) Reduce the load and reset the switch on the front panel (on-off). b.) battery has discharged. Recharge the battery after the mains or solar restoration. c) Check or reduce the output load & turn the reset switch on the front panel (OFF-ON). Call electrician to check the short circuit.
4. Backups not satisfactory with PV connected	a) Connect the PV wire in the correct terminal with correct polarity as per marking. b) The PV panel should be mounted properly with the correct angle. c) Voc should be within the range which is mentioned in the technical specification.



# Technical Specifications

Input Voltage (Wide Mode)	90V-290V±10V			
Input Voltage (Narrow Mode)	170V-270V±10V			
Output Voltage on Mains Mode	Same as input			
Output voltage on Backup Mode	220V + 10%, -15%			
Output frequency on Backup Mode	50Hz ± 0.1Hz			
Switching from mains to Backup and from Backup to Mains	Automatic			
Output Waveform on Mains mode	Same as input			
Output Waveform on Backup mode	Pure Sine Wave			
Battery Charging Current	Constant charging approx 10% of the rated battery current in Ah			
Charger	CCCV			
PCU overload/PCU Short Circuit	110%/150%			
PCU Transfer Time	<=15msec			
Technology	DSPIC BASED DESIGN			
Auto Reset Feature	Yes			
Operating Temperature	-10°C to +45°C			
Voc RANGE	500VA-12V	1000VA-12V	1500VA-24V	2000VA-24V
	15V-52V		30V-105V	
MAX PV Power	500W	1000W	1500W	2000W
Solar Current MAX.	32±3A	60±3A	50±3A	68±3A
Type of Charge	MPPT WITH ISOLATED GATE DRIVE			

## \*NOTE:-

- Power factor may vary depending upon the load.
- Because of a policy of continuous product improvement, specifications are subject to change without notice.

## Going On Vacations

1. Must put the PCU ON/OFF switch in off Position.
2. Must put the HOME AWAY switch in ENABLE Position.

## Instrument Description:-

Eastman Solar Pro Max Series External Battery PCU

- Single Battery (12V) systems.  
**SOLAR PROMAX 500V-12V**  
**SOLAR PROMAX 1000VA-12V**
- Two Battery (24V) systems.  
**SOLAR PROMAX 1500VA-24V**  
**SOLAR PROMAX 2000VA-24V**



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