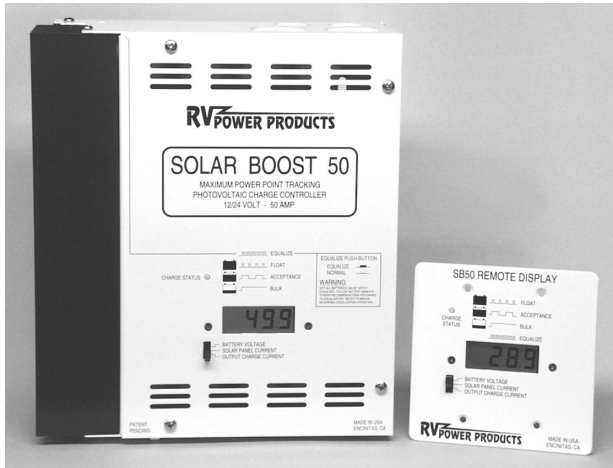




SOLAR BOOST™ 50

50 AMP MAXIMUM POWER POINT TRACKING PV CHARGE CONTROLLER



Pictured with optional digital displays

LOOKING FOR THE BEST IN PHOTOVOLTAIC CHARGE CONTROL?

GET IMPROVED PERFORMANCE FROM YOUR PV ARRAY AND BATTERIES WITH SOLAR BOOST 50

■ The *Ultimate* Photovoltaic Charge Controller... Increases Charge Current Up To 30% Or More!

Solar Boost 50 is a 12/24 volt photovoltaic (PV) charge controller capable of delivering up to 50 amps of output current. Patent pending *maximum power point tracking* (MPPT) technology allows Solar Boost 50 to extract more power from the PV array, resulting in a charge current increase of up to 30% or more. Controllers without this technology simply can't deliver the current provided by Solar Boost 50. Don't waste money by throwing PV power away! Get the power you paid for with Solar Boost 50.

Solar Boost 50 does much more than increase charge current. It offers an advanced fully automatic three stage charge control system to ensure the battery is properly and fully charged, resulting in enhanced battery performance with less battery maintenance. Reliable high efficiency power conversion is achieved using the latest generation power MOSFET transistors, with output power delivered via a series pass *Pulse Width Modulation* (PWM) control scheme. An electronic current limit feature prevents output current from exceeding 50 amps. Output current limit eliminates worry about overload or nuisance fuse blow when PV power production is unexpectedly high. An equalize function is also included to periodically condition liquid electrolyte lead-acid batteries.

An optional user friendly digital display is available to monitor PV charge performance. The display shows battery voltage, solar panel current, output charge current, charge mode and state of charge. It can be provided in the controller as pictured above, as a remote panel installed up to 300' away, or both. Optional temperature compensation of charge voltage is also available to further improve charge control and battery performance. Selectable temperature compensation curves support both lead-acid and NiCd battery chemistries.

- Patent Pending Maximum Power Point Tracking (MPPT) Technology Increases Charge Current up to 30% Or More!
- Charge Current Increase Can Save Money By Requiring Fewer PV Panels And Simplifying PV Panel Installation
- Configurable Multistage Charge Control Optimizes Charge Parameters To Battery Size, Type And Temperature
- Accommodates External Battery Shunt Providing Optimal Charge Control And Enhanced Battery Performance
- Available Temperature Compensation Further Improves Charge Control And Battery Performance
- 50 Amp 12/24 Volt Rating Supports Large PV Arrays
- Electronic Current Limit Prevents Overload Or Nuisance Fuse Blow
- Available Digital Display Monitors PV Charge Performance
- Full 36 Month Limited Warranty

RVPOWER PRODUCTS

1058 Monterey Vista Way, Encinitas, CA 92024, USA
800-493-RVPP • 760-944-8882
www.rvpowerproducts.com

■ How Does Solar Boost 50 Increase Charge Current?

A photovoltaic (PV) array is a *constant current* device. As shown on a typical PV panel voltage-current curve, current remains relatively constant over a wide range of voltage. A typical 75 watt panel delivers 4.45 amps @ 17 volts. Traditional PV controllers connect the PV array directly to the battery when the battery is discharged. When this 75 watt panel is connected directly to a battery charging at 12 volts, the PV panel still provides about the same current. But, because PV output voltage is lower, it can only deliver 53 watts to the battery. This wastes a whopping 22 watts or nearly 30% of the available power!

Solar Boost 50's patent pending *maximum power point tracking* (MPPT) technology operates in a very different fashion. Under these conditions Solar Boost 50 calculates the voltage at which the PV panel delivers maximum power, in this case 17 volts. It then operates the PV panel at 17 volts to extract maximum power. Solar Boost 50 continually recalculates the maximum power voltage as operating conditions change. PV output power, now 75 watts, feeds a high efficiency power converter which reduces the 17 volt input to battery voltage at the output. The full 75 watts delivered at 12 volts produces 6.25 amps. A charge current increase of 1.8 amps or 40% is achieved by converting the 22 watts that would have been wasted into useable charge current. This example assumes 100% efficiency to illustrate the principal of operation. Actual boost will be somewhat less as a small amount of power is lost in wiring, connections, fuses and in Solar Boost 50.

The actual charge current increase you will receive varies with PV temperature and battery voltage. Lower PV temperature increases available power, while lower battery voltage increases current for a particular PV output power level. Under normal conditions in comfortable temperatures, current increase typically varies between 10 to 25%, with 30% or more easily achieved with a discharged battery and cooler temperatures. What you can be sure of is that Solar Boost 50 will deliver the highest charge current possible for a given set of operating conditions. In conditions where extra power is not available from the PV array, Solar Boost 50 will operate as a high performance series pass PWM controller.

■ Three Stage Battery Charging

- **Bulk Charge** – Charge begins with a high current of up to 50 amps. During this stage the battery receives maximum available current to rapidly recharge the battery.
- **Acceptance Charge** – Following bulk charge the acceptance voltage is applied to the battery. During this stage, charge current decreases as the battery charges.
- **Float Charge** – Once the battery is fully charged, the float voltage is applied to the battery to properly maintain it in a fully charged state without excessive water loss.
- **Equalization** – A fourth charge mode. Equalization is a controlled overcharge which is manually enabled to periodically condition flooded lead-acid batteries.

■ Three Stage Charging Taken To The Next Level...

Controllers that determine full charge based on time or other arbitrary factors cannot realize all the benefits three stage charging has to offer. The proper indication of when a lead-acid battery is fully charged is when *net battery charge current* during acceptance charge decreases to 1.0 amps per 100 amp-hours of battery capacity. Solar Boost 50 uses net battery charge current *optimized to battery size in amp-hours* to determine full charge. This method charges the battery quickly and completely without undercharge, overcharge or excessive water loss. An internal precision alloy shunt is used to measure battery current when battery load during charge is relatively constant. When battery load is highly variable during charge, Solar Boost 50 can connect to an external shunt measuring net battery current. If desired, Solar Boost 50 can also operate as a two stage charger.

■ Specifications

Output current rating.....	50A
System voltage	12/24V nominal
PV maximum open circuit voltage	57V
Voltmeter range/accuracy.....	60.0V/±0.30% F.S.
Current meter range/accuracy.....	60.0A/±0.50% F.S.
Standby current	30mA typical
Charge on current....12/24V	150/90mA typical
Acceptance voltage adjust range	13-16V/26-32V
Float voltage adjust range	0-2V/0-4V < Accp.
Equalize voltage.	1V/2V > Accp.
Power conversion efficiency.....	97% typical @ 40A
Temperature comp. coefficient.....	-5.0/-2.0mV/°C/cell
Cabinet dimensions	10"Hx8¾"Wx3½"D
Remote display dimensions	4½"Hx4½"Wx1¾"D

■ Part Numbers & Shipping Weight

Solar Boost 50 w/o display	SB50.....	8¾ lbs
Solar Boost 50 w/digital display	SB50D	9 lbs
SB50 front panel digital display	SB50PD	2¼ lbs
SB50 remote display, 25' cable.....	SB50RD25	2 lbs
Battery Temp. sensor, 20' cable....	930-0022-20.....	1 lbs

Available From:

As a part of our continuous improvement process specifications are subject to change without prior notice
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