



**MODEL RATINGS**

	SunSaver-6	SunSaver-10	
Rated PV current (amps)	6.5	10	• All models are 12 volts
Rated LVD current (amps)*	6.0	10	

\* Low voltage load disconnect (LVD) is available as an option.

**RELIABILITY**

- 5-year failure rates at a 95% confidence level
- SunSaver-6 ..... < 0.1%
  - SunSaver-10 ..... 0.2%

**PERFORMANCE / ELECTRICAL**

- Accuracy:
  - Sealed ..... +/- 35 mV
  - Flooded ..... +/- 60 mV
  - LVD ..... +/- 80 mV
- Maximum array voltage ..... 30 V
- Minimum voltage to operate ..... 6 V
- Ground ..... negative
- Parallel capability ..... yes
- Self-consumption (tare):
  - Night ..... 4.3 mA
  - Charging ..... 6.2 mA
  - LVD ..... 6.6 mA
- Voltage drops (typical):
  - PV/Battery ..... 0.4 volts
  - Battery/Load ..... 0.3 volts
- Operating life ..... 15 years
- Noise
  - Output noise pulses ..... < 300 mV
  - Noise pulse width ..... < 500 nanosec
  - Radiated noise ..... < 10 nanoW/kHz
- FETs:
  - Pulse rating ..... 120 A
  - Junction temp rating ..... 175°C
  - Operating junction temp ..... 105°C
- Transient surge suppressors:
  - Pulse power rating ..... 1500 watts
  - Response ..... < 5 nanosec
- 25% current overload capability ..... 5 minutes
- Reverse current leakage ..... < 10 µA
- Reverse polarity protection:
  - PV ..... yes
  - Battery ..... yes
  - Load ..... yes

**ENVIRONMENTAL**

- Operating temperature ..... -40 to +85°C
- Max ambient temperature ..... +60°C
- Storage temperature ..... -55 to +100°C
- Humidity ..... 100%

**MECHANICAL**

- Dimensions: (inches) ..... 6.0 x 2.2 x 1.3 (W-H-D)
- (mm) ..... 152 x 56 x 33 (W-H-D)
- Weight (oz) ..... 8
- (kg) ..... 0.23
- Wire terminals:
  - Wires per terminal ..... 1 or 2 wires
  - Max size per wire ..... #10 AWG
  - 5.2 mm<sup>2</sup>
- Screw material ..... Nickel plated brass
- Terminal material ..... Tin/Copper plated brass
- Encapsulation ..... Epoxy
- Case ..... 6063-T5 Aluminum
- Finish ..... Electrolytic anodize
- Mounting orientation ..... Any

**CONTROL SETPOINTS**

	Sealed	Flooded
• Low volt load disconnect	11.5	11.5
• LVD reconnect	12.6	12.6
• Constant-voltage regulation	14.1	14.4

**CONTROL PARAMETERS**

- Charge algorithm ..... constant-voltage series configuration
- PWM duty cycle ..... 0% to 100%
- Temp comp coefficient ..... -20 mV/°C (25°C ref)
- LVD delay ..... 2 seconds

Specifications subject to change without notice.

Manufactured in the U.S.A.

**WARRANTY:** FIVE YEAR WARRANTY PERIOD. CONTACT MORNINGSTAR OR YOUR AUTHORIZED DISTRIBUTOR FOR COMPLETE TERMS.

**AUTHORIZED MORNINGSTAR DISTRIBUTOR:**



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**SUNSAVER**

PATENTED

USING ADVANCED TECHNOLOGY FOR:

- High Reliability
- Low Cost
- PWM Battery Charging

SUNSAVER™  
 PHOTOVOLTAIC CONTROLLERS  
 FOR SMALL PV SYSTEMS

**PWM BATTERY CHARGING**  
Series PWM (pulse-width modulation) design will reduce heating and system voltage drops. Precise finishing charge under all system conditions.

**PREVENTS REVERSE CURRENT**  
Series switching prevents battery from discharging at night through the PV modules.

**RUGGED CASE**  
An aluminum case with electrolytic anodized finish and removable cover. Stainless steel screws and silkscreened UV resistant label.

**WEATHER RESISTANT**  
Encapsulated in epoxy compound for service in harsh environments.

**REVERSE POLARITY PROTECTED**  
Full electronic protection against reversed PV, Battery or Load wire connections. No fuses are required for this safety feature.

**CHARGING LED**  
A green LED indicates when the battery is receiving energy from the PV modules.

**TEMPERATURE COMPENSATION**  
Battery charging setpoints corrected for temperature variations.

**LVD INDICATOR**  
(with LVD option) Red LED to indicate a load disconnect condition. LVD has a 2 second delay to avoid nuisance disconnects.



**MARINE RATED TERMINALS**  
Copper plated brass terminals with nickel plated brass screws. Clamping plate provides gas tight wire connections.

**LOW VOLTAGE LOAD DISCONNECT (LVD)**  
(Option) Low resistance FETs are suitable for all loads and will handle load starting currents up to 10 times load rating.

**FIELD SELECTABLE BATTERY TYPE**  
For precise battery charging, either a flooded or sealed battery can be selected with a simple jumper. Can change selection any number of times.

**INDUSTRIAL RATED COMPONENTS**  
Higher quality components provide longer life, higher reliability, and extended operating temperatures.

**TRANSIENT VOLTAGE SUPPRESSORS**  
Large avalanche transient suppressors provide a high level of protection against lightning surges and other voltage and current transients.

**NO NEED TO DERATE**  
All electrical and mechanical designs are for worst-case conditions. In addition, a 1.25 minimum design margin is used.

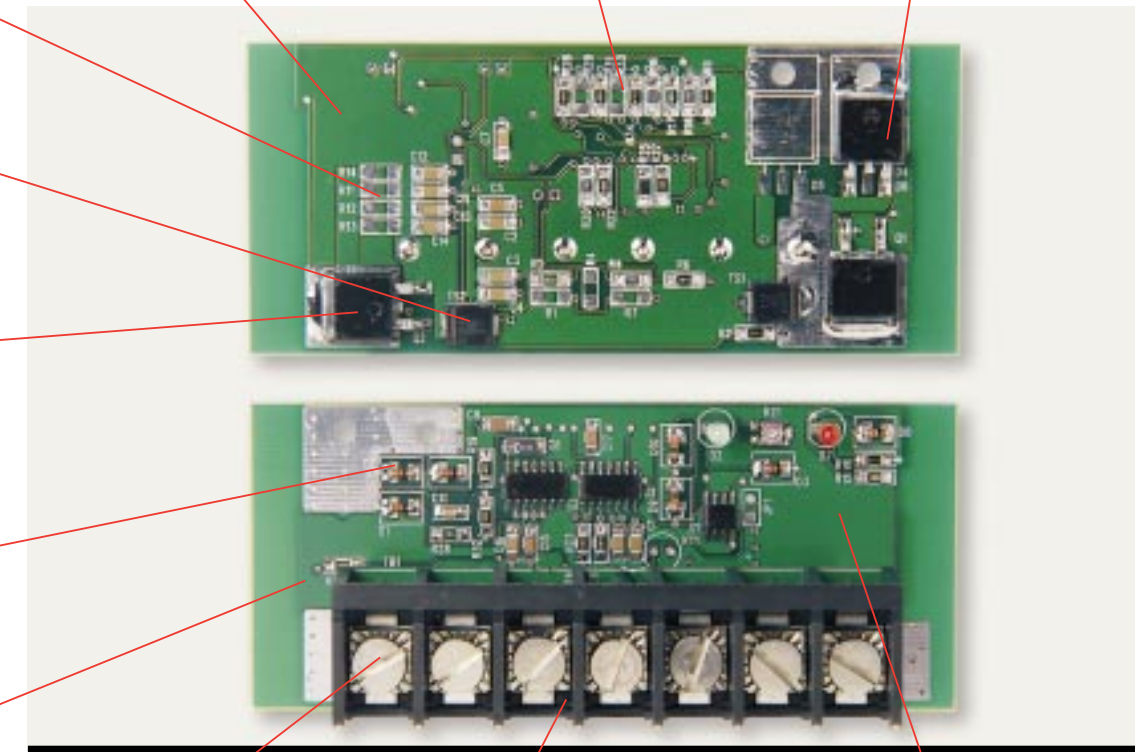
**LOW NOISE**  
All inputs and outputs are RC filtered. Output line noise is held to extremely low energy pulses.

**HIGH EFFICIENCY**  
Designed to minimize energy losses with very low self-consumption and voltage drops. Requires only 3.2 mA to operate.

**THERMAL DESIGN**  
Large 2 oz copper traces, thermally conductive encapsulation, internal heatsinks, and optimized FET switching minimizes operating temperatures.

**SURFACE MOUNT TECHNOLOGY**  
Latest device technologies and automated production. Results in consistently high quality product at lowest cost.

**100% SOLID STATE**  
All power switching by rugged, low resistance FETs. Eliminates problems with mechanical relays.



**LARGE TERMINALS**  
Wire clamping screws accept 2 wires per terminal (each wire up to #10 AWG / 5mm<sup>2</sup>). Tri-Barrier polypropylene case provides terminal isolation.

**UNSURPASSED SPECIFICATIONS**  
The SunSaver provides reliability and battery charging that is very similar to the highly successful ProStar controller.

**SERIES BATTERY CHARGING**  
Highly advanced charging with PWM constant voltage algorithm, a series switching design, and very accurate setpoints.

**SUNSAVER**  
OPTIONS TO MEET YOUR SPECIAL NEEDS

- Solar home system model
- Lighting controller model
- FUTURE SUNSAVER OPTIONS**
- Special features model:
  - field selectable setpoints
  - automatic equalization
  - current compensated LVD
  - HVD load protection
  - overtemperature shutdown
- 3 amp model

**SUNSAVER**  
SUPERIOR SERIES SWITCHING

Designed by experienced PV system engineers, SunSaver's series design provides many advantages compared to shunt controllers. Series regulation reduces FET heating and lowers voltage stress on the power FETs. A series configuration also improves protection against lightning surges and reduces switching noise. The series design improves charging accuracy. In PWM, series switching becomes self-correcting for temperature and system voltage drops.

**SUNSAVER**  
ADVANCED PWM BATTERY CHARGING

SunSaver's battery charging design closely copies the ProStar's advanced charging algorithm. The series pulse-width modulation (PWM) algorithm is very stable, yet responds instantly to changing conditions. Maximum charging efficiency is ensured, with minimum stress on the battery. The constant voltage PWM charging is a proven advancement compared to the common on/off PV regulators.

- SUNSAVER BATTERY CHARGING FEATURES INCLUDE:**
- true 0 to 100% PWM duty cycle
  - series design for constant voltage charging
  - temperature compensation
  - field selectable for sealed or flooded battery
  - pulse charging of the battery
  - setpoint accuracy to +/-35 mV
- IMPROVED CHARGING PROVIDES THESE BENEFITS:**
- longer battery life
  - high charging efficiency
  - less battery gassing
  - precise battery charging under any conditions
  - charging the battery to 100% capacity
  - higher average battery state-of-charge