

# SUNSAVER™

## SOLAR CONTROLLER



Morningstar is pleased to introduce our third generation **SunSaver**. Since its first market introduction in 1996, over 1 million SunSaver controllers have been installed in over 73 countries for numerous solar power systems including oil/gas, telecom and instrumentation, marine and boating, and remote homes. We have retained much of our legacy design including the same ratings, footprint and simple user interface, and have added several new and advanced high value features:

- Full electronic protections
- 4 stage battery charging
- Self-diagnostics to detect critical faults
- Multi-color status LED
- 3 LED's for battery state of charge
- Dead battery recovery
- Telecom mode for sensitive loads
- Maximum charge limiting for sensitive loads
- Cover to protect wire terminals
- Additional certifications



### Key Features and Benefits

#### ■ **Extremely High Reliability**

- Failure rate of less than 1 per 1,000 shipped (<0.1%)
- 100% solid state. Power MOSFET design
- Manufactured in an ISO 9000 factory
- 100% pre-shipment functional testing

#### ■ **Longer Battery Life**

- Advanced PWM charging
- Series design (not shunt) for cool operation
- 4-stage charging: bulk, absorption, float, equalize
- Optimized sealed or flooded battery set points
- Temperature compensated charging
- Low voltage load disconnect on several versions

#### ■ **Designed for Harsh Environments**

- Temperature rating of  $-40^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$
- Epoxy encapsulation for protection against humidity and dust ingress
- Corrosion protection: marine rated terminals and anodized aluminum case
- Certified for use in hazardous locations

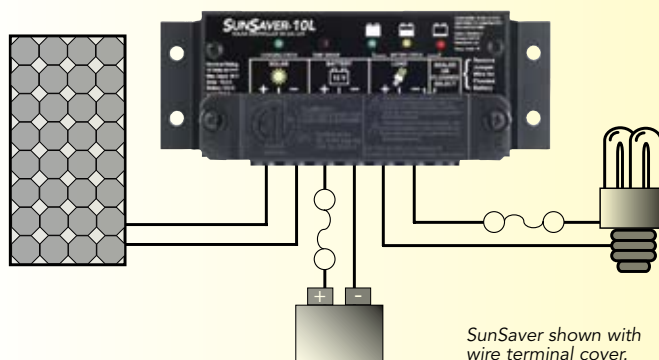
#### ■ **Easy to Install and Use**

- Factory pre-sets result in no required install settings
- Electronic protections prevent damage from wiring mistakes
- Fully automatic operation and fault recovery
- LED's display extensive information about status, faults and battery condition

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## SunSaver Versions

	Solar Current	Load Current	System Voltage	LVD
• SS-6-12V	6A	6A	12V	No
• SS-6L-12V	6A	6A	12V	Yes
• SS-10-12V	10A	10A	12V	No
• SS-10L-12V	10A	10A	12V	Yes
• SS-10L-24V	10A	10A	24V	Yes
• SS-20L-12V	20A	20A	12V	Yes
• SS-20L-24V	20A	20A	24V	Yes



## TECHNICAL SPECIFICATIONS

### Electrical

- **Max. PV and load ratings** Per above
- **System voltage** 12 or 24 volts
- **Min. battery voltage** 1 volt
- **Regulation voltage**

	12 volt	24 volt
Sealed battery	14.1 V	28.2 V
Flooded battery	14.4 V	28.8 V
- **Load disconnect** 11.5 V 23.0 V
- **LVD reconnect** 12.6 V 25.2 V
- **Max. solar voltage**

12V battery	30 volts
24V battery	60 volts
- **Load in-rush capability**

SunSaver-6	45 amps
SunSaver-10	65 amps
SunSaver-20	140 amps
- **Self-consumption** < 8 mA
- **Voltage accuracy**

12V: +/- 25 mV (typical)
24V: +/- 48 mV (typical)
- **Transient surge protection** 1500W per connection

### Mechanical

- **Wire size** 5 mm<sup>2</sup> / #10 AWG
- **Weight (unpacked)** 0.23kg / 8 oz.
- **Dimensions** 15.2 x 5.5 x 3.4 cm  
6.0 x 2.2 x 1.3 inch

### Environmental

- **Ambient temperature** -40°C to +60°C
- **Storage temperature** -55°C to +80°C
- **Humidity** 100% non-condensing
- **Tropicalization** Epoxy encapsulation  
Marine rated terminals  
Anodized aluminum case

### Electronic Protections

- **Solar:** Overload, short-circuit, high voltage
- **Load:** Overload, short-circuit, high voltage
- **Battery:** High voltage
- **All:** Reverse polarity, high temperature, lightning and transient surges
- **Reverse current at night**

### Battery Charging

- **Charging method** 4 stage series PWM
- **Charging stages** Bulk, absorption, float, equalize
- **Temperature compensation**

Coefficient	12V: -30mV/°C 24V: -60mV/°C
Range	-30°C to +60°C
Set points	Absorption, float, equalize

### LED Indications

- **Status LED (1)** Charging or not charging  
Solar error conditions
- **Battery LED's (3)** Battery level  
Charging stage

### Certifications

- **ETL Listed to UL 1741 and CSA C22.2 No. 107.1-01**
- **Hazardous Locations** Class 1, Division 2,  
Groups A,B,C,D  
CSA C22.2#213
- **EMC Directives** Immunity, emissions, safety
- **FCC** Class B Part 15
- **CE**
- **RoHS**
- **ISO 9000**

**WARRANTY:** Five year warranty period. Contact Morningstar or your authorized distributor for complete terms.

