

# Specifications

## Features

- Unique - Night time shutdown
- Protection (PV & Batt), against short-circuit & reverse polarity, overload, over temperature & battery removal
- Can charge a completely discharged battery
- Extreme design -40° to +50°C (-40° to +120°F)
- Reliable - 100% solid state
- Fully encapsulated in epoxy potting
- 5 year warranty
- Manufactured with solar power
- Designed and built in North America

**Model** S5 or S5-24V

## Electrical Specifications

Voltage configurations 12 volts or 24 volts (fixed)  
(custom voltages 10 to 36 volts)

Max. PV open circuit voltage 40V for reverse batt.  
protection.

Max. Charging current at 50 °C (+120F) 5 amps DC

Daytime consumption 0.7mA, 2.5 mA when charging

Night time consumption 0.24 mA

Typical set points: 14.4V / 28.8V Volts at 20°C (68°F)

Float 13.6V. Temperature compensated.

Optional lithium setpoints no charge below 4C.

## General Specifications

Temperature range: -40° to +60°C (-40° to +140°F)

Case: ABS case, completely sealed in epoxy

Weight: 90 grams (approx. 3.2oz)

Size: 5.1 x 5.1 x 3.8 cm (2 x 2 x 1.5 in. , 3 inches wide  
with the tabs)

Wire: 16 AWG, 15 cm / 6 in.

## Features & Options

Custom voltage setpoints & time delays

Custom wire lead lengths



## Full 5-Year Warranty

Warranted in entirety, except abuse, within a period of 5 years following the date of purchase. In the event a defect develops during the warranty period, return the unit to eco energy, postage paid. Eco energy will repair or replace the product with a new or reconditioned unit of equivalent quality.

## Eco Energy

Since 1992, Eco Energy has been in the business of designing and manufacturing solar charge controllers, battery chargers, voltage switches, and solar lighting controls.

Eco Energy controls are currently used in power systems for remote homes and cottages, recreational vehicles, boats, telecommunication and navigational systems, natural gas pipeline operations and other solar battery charging applications around the world.

Eco Energy has a 6.5 KW array which is used to manufacture our controls.



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# Installation Guide

## S5

# 5 Amp PWM 3 Stage Advanced Solar Controller With Temperature Compensation

IP67



Advanced Control Solutions

# S5



Before charging, read the instructions



**WARNING: Explosive gases. Prevent flames and sparks. Provide adequate ventilation during charging.**



**Disconnect (or cover the PV module) supply before making or breaking the connections to the battery.** Failure to do this can result in the load being directly

connected to the PV and the excess voltage may damage the load. A three pin connector can be used on the battery leads which also disconnects the load when the battery is removed or replaced.

## Unique Design

Our latest innovation in solar charge controllers, the Advanced Solar Controller series. Tough, easy to install and practically indestructible.

This high performance solar charge controller increases battery life by preventing overcharging. Overcharging can cause corrosion and buckling of the lead plates, increased battery water loss and excess hydrogen gas.

The control also prevents power loss back into the solar modules at night, so an external blocking diode is not required.

Unique low battery drain - Battery standby power consumption is 0.2 mA. In the dark they use no power, ideal for PV systems where efficiency is important. Leave it connected all winter without draining the batteries. Some other controls which have a standby current draw will drain the battery over the winter with no solar input, reducing the freeze protection of the battery.

Efficient Design – automatic nighttime shutdown with an intelligent design results in the controller using < 1/10th the power of the industry average. Other controls stay on all night, wasting precious power.

# Installation

## Location

The controller needs to be in a cool location in order to function properly. It should not be in direct sunlight, or mounted in a hot location such as the back of a solar module. The controller should be installed near the batteries, to ensure an accurate battery voltage measurement. The distance from the solar panels to the controller should not exceed 18m/60 feet.

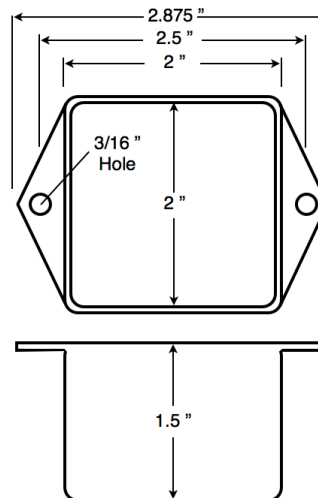
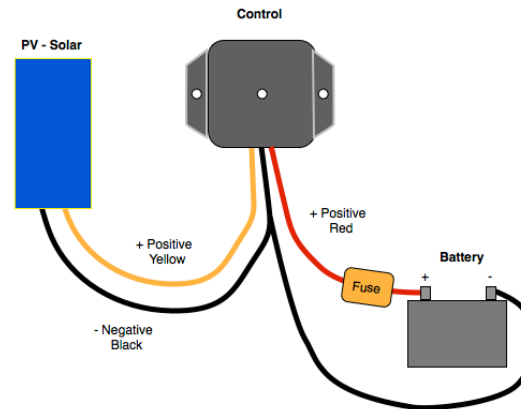


## Wiring

Min. 1mm<sup>2</sup> #18 AWG or larger wire should be used.



Max. PV voltage for reverse battery protection is 40V.



# Operation

## Operation

The controller protects batteries from overcharging. It allows solar power to charge the batteries until the batteries rise to the full voltage set point. It then maintains the battery voltage at this setpoint. Because a battery voltage fluctuates, it is normal for the charging light to turn on and off as the battery approaches full charge. When full charge is achieved the charging light will go out completely.

## Charging Flashes

Three Flashes - Charging below charging setpoint  
Two Flashes - Charging at charging setpoint  
One Flash - In float charging mode  
No Flash - Charging on hold

The control will switch to float mode after the battery has been at the charging setpoint for a minimum of 10 minutes and a maximum of 4 hours. The amount of time the battery takes to reach the charging setpoint determines the amount of time that is required before switching to float mode. The control will stay in float mode for a minimum of 5 minutes. If the battery voltage drops below the float setpoint a new charging cycle will begin.

At night the control shuts down to save power.

## Fault Conditions

The charging light is off to indicate a fault during solar short circuit, solar or reversed battery, over-temperature and battery short circuit conditions. Remove solar power to reset the control.

No damage will occur if the battery is removed, or if the control is directly connected to the solar module without a battery.

## Testing

To test the operation of the control measure the current from the solar module or to the battery. Do not measure the output voltage without the control connected to a battery as the control shuts off if the battery voltage is too low for safety in the event of a short circuit.

