

**ELECTRICAL INFORMATION**

<b>Typical Electrical Characteristics (1) – SA-5</b>
Current at design operating point (Iop) 330 mA
Voltage at design operating point (Vop) 15V
<b>Effects of Temperature</b>
Temperature coefficient of current 300 uA/°C
Temperature coefficient of voltage -60 mV/°C
Temperature coefficient of power -0.3%/°C
Minimum electrical specifications can be obtained by contacting your factory representative.

**TILT ANGLE**

The following table shows the angle (from horizontal) at which the module should be installed in order to maximize annual energy output. At most latitudes, performance can be improved by less of an angle during the summer and more of an angle during the winter.

**LATITUDE INSTALLATION ANGLE**

0-4°	10° from horizontal
5-20°	Add 5° to local latitude
21-45°	Add 10° to local latitude
45-65°	Add 15° to local latitude
66-75°	80° from horizontal

**PLACEMENT**

The module should be oriented toward the sun as much as possible. This is especially important during the middle part of the day – the module’s most productive period. It is important to keep the module free from all shadowing.

**DIRECTIONAL FACING**

As a general rule, modules used in the northern hemisphere should be faced due south (not magnetic south). Modules used in the southern hemisphere should face due north (not magnetic north).



This photovoltaic module generates DC electricity when exposed to sunlight and other light sources. The Chargers are designed for safe operation in 12-volt systems only.

**MOUNTING**

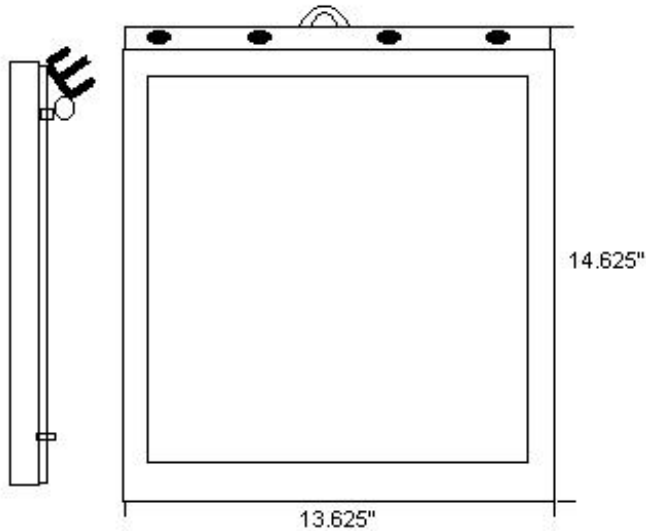
Attach the solar panel to a 2” vertical pipe or similar structure using the U bolt supplied. Fasten the cable to the mounting pole below the panel with a cable tie or tape to provide strain relief for the cable.

**CONNECTIONS**

Connections from the solar module to the battery or appliance should be tight and sound. Crimped connectors, or if splicing wires together, wire nuts or soldering are appropriate. Be certain that connections are protected against corrosion and short circuit conditions.

The solar module should be connected to the battery or appliance with matching polarity. The red wire is positive (+) and the black wire is negative (-) on this solar panel. Connect (+) to (+) and (-) to (-), in a dry area and in the shade.

<b>MECHANICAL INFORMATION</b>	
Weight	8.5 lbs.
Dimensions	All dimensions are in inches
Mounting Holes	Height 10.00" (25.40 cm) Width 12.87" (32.69 cm) Diameter .27" (0.69 cm)



## **LIMITED WARRANTY**

### Limited Warranty – One Year

Manufacturer warrants the module to be free from defects in materials and workmanship under normal applications, installation, use and service conditions for twelve (12) months from date of sale to the original consumer purchaser. Manufacturer will, at its option, either repair or replace the product, or refund the purchase price, if it becomes inoperable due to a defect in material or workmanship during the twelve (12) month period of this warranty.

### Limited Warranty Three-Year Extended Term

For three (3) years from the date of sale of modules to the original consumer purchaser, manufacturer will replace or repair modules that exhibit a power output less than 90% of the rated power specified at time of delivery by manufacturer, provided that such lost power is determined by manufacturer to be due to defects in material or workmanship.

What is covered by the Warranty? This warranty does not apply to any module which in manufacturer's judgment has been subject to misuse, neglect or accident or which has been damaged through abuse, alteration, improper installation or application, or negligence in use, storage, transportation or handling, or repaired by anyone other than manufacturer. The warranty does not cover any transportation costs for return of module or other reshipment or any repaired or replaced module, or cost associated with installation, removal or reinstallation of module.

## **WARRANTY LIMITATIONS**

Manufacturer shall have no responsibility for damage to persons or property or other loss or injury resulting from a defect in the module from improper use or installation. Under no circumstances will manufacturer be liable for any incidental or consequential damage.

Any warranties implied by law, including those of merchantability and fitness for a particular purpose are limited in duration to the twelve months after date of original purchase.

Manufacturer's maximum liability under any warranty, express, implied, or statutory, is limited to the purchase price of the module. The purchaser's exclusive remedy shall be only as stated herein. This warranty is in lieu of all other warranties expressed or implied.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so that above limitations or exclusions may not apply to you.