INSTALLATION GUIDE FOR PVL-64 ON RV (Caravan) ROOFS

Safety Warnings

- *UNI-SOLAR* photovoltaic (PV) Modules produce DC electricity when exposed to the sun or other light sources. The power from one individual module is not considered hazardous. However, if connected in series and/or connected in parallel, the potential shock hazard increases.

- The *SOLAR FORCE* ® RV Solar Charging Kits will produce DC voltage and, after the Kit is assembled, AC voltage can be produced with the addition of an inverter (not included in this kit).Follow all steps in the Manual to ensure the system is properly grounded and that all electrical connections are tightened properly.

CAUTION!!!
***UNI-SOLAR* photovoltaic (PV) modules contain live electrical components enclosed and protected within. Do not cut or bend the photovoltaic modules in any way. Do not drive screws into any part of the photovoltaic module. Doing so can cause electric shock, may result in fire, and will void the warranty.**

RV Solar Laminate Installers:

- Do not place equipment on the active area of the solar module.
- Avoid dropping any sharp, heavy objects on the solar modules.
- Observe safe electrical practices at all times. Use insulated tools when wiring solar modules.
- Ensure the solar modules are completely covered with an opaque material before making wiring connections to reduce the risk of electric shock or sparks.
- Observe proper polarity when connecting the solar roofing laminates into an electrical circuit (see section on wiring).Reverse connection will damage the solar modules, may result in fire and will void the warranty.

UNI-SOLAR "PV " Laminate Specifications

Physical Specifications

	Laminate Length	Laminate Width	Laminate Thickness	Weight
PVL-64	8' 6"	15.5 in.	0.165 in.	8.2 lb.

Electrical Specifications

Specifications and Performance	PVL-64
Rated Power (Watts)	64
Nominal Voltage (Volts)	12
Operating Voltage (Volts)	16.5
Operating Current (Amps)	3.88
Open-Circuit Voltage (Volts)	23.1
Open-Circuit Voltage (Volts) @-10 °C and 1250 W/m2	24.6
Short-Circuit Current (Amps)	4.8
Short-Circuit Current (Amps) @75 °C and 1250 W/m2	6.3
Series Fuse Rating (Amps)*	8
Min. Blocking Diode (Amps)	8

NOTES:

- During the first 8-10 weeks of operation, electrical output exceeds specified ratings. Power output may be higher by 15%,operating voltage may be higher by 11%and operating current may be higher by 4%.
- Electrical specifications (± 5%%)are based on measurements performed at standard test conditions of 1000 W/m2 irradiance, Air Mass 1.5,and Cell Temperature of 25 °C after long-term stabilization. Actual performance may vary up to 10%from rated power due to low temperature operation, spectral and other related effects.
- Maximum system open-circuit voltage not to exceed 30 VDC.
- Specifications subject to change without notice.

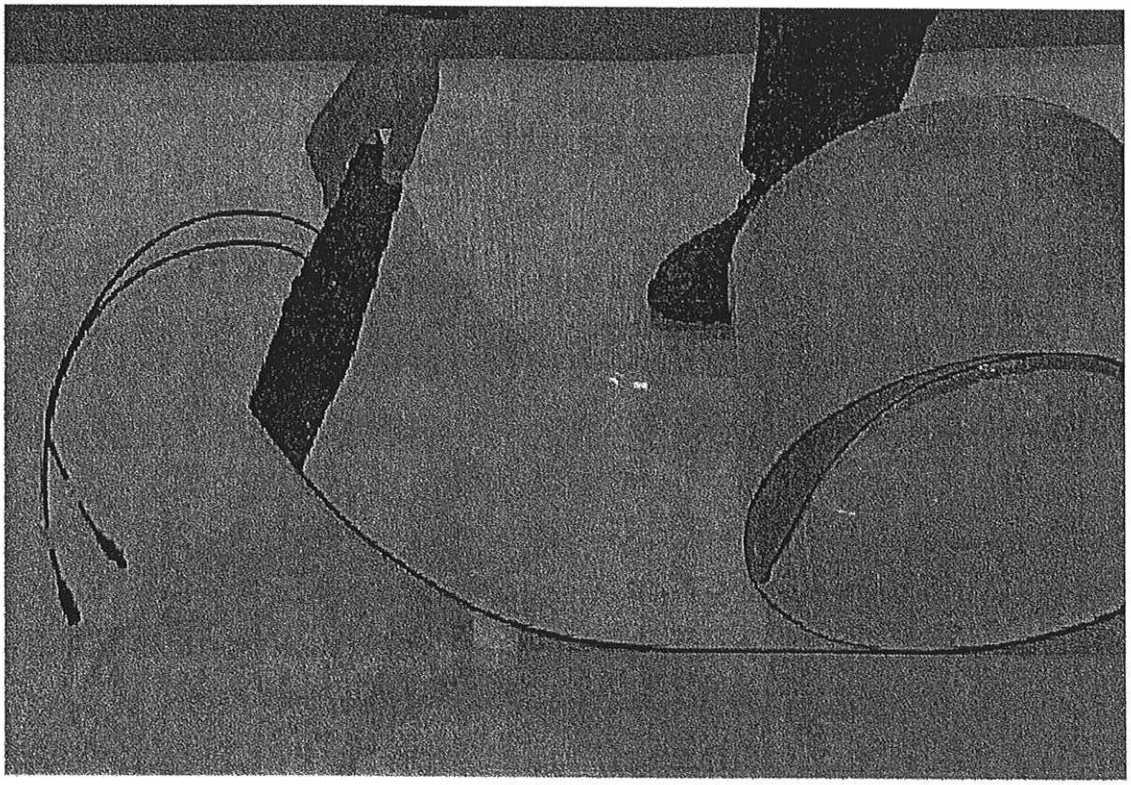
Installation Instructions for the PVL-64 on RV roof:

1) Go to the Roof. Clean the roof under the Laminate position. If the Roof is a "membrane " roof, a non-conditioning roof membrane cleaner may be needed to remove the majority of dirt from the roof surface. Fiberglass or metal roofs may also be pre-cleaned with non-conditioning type specialty cleaners.

2) After the roof has been pre-cleaned, a final cleaning must be done with an Isopropyl /Water solution to ensure the surface is ready for bonding.

3) Unroll and align the laminate and double stick assembly on the roof.

4) Lift up the laminate and double stick assembly about 300 mm (12 ") off of the roof surface. Peel the release paper off of the double stick material approximately 150 mm (6 ")off the roof surface and fold it under. Make sure the laminate is centered on the does not move on the roof during the process. **This is critical as the laminate 's position will be fixed after the first six inches is bonded to the roof.**



5) Stick the peeled end of the laminate assembly onto the roof surface. Roll up the rest of the laminate assembly up to the stuck portion of the laminate. After the laminate assembly is rolled up on the roof surface, one person should peel the release paper from the bottom of the laminate assembly as another person unrolls the laminate onto the roof surface. Stick the remaining laminate to the roof surface.