

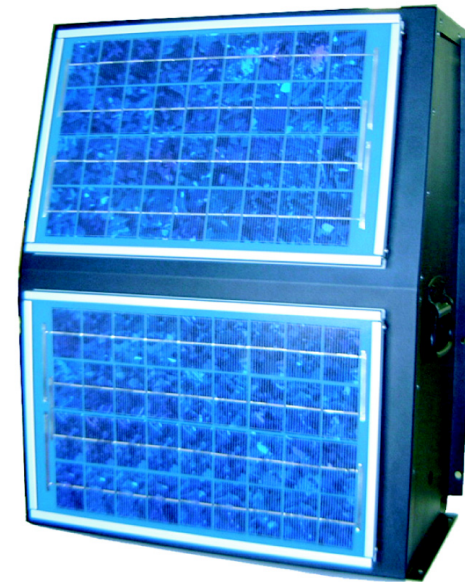


**UNIVERSAL SOLAR SYSTEM
(USS)**

USER MANUAL

**For Millennium Low Power Gas Detectors
or other continuous loads less than 0.8 Watts (12 V dc)**

ISO 9001:2000



Part Number: MAN-0048-00 Rev 3
May 2006

IMPORTANT INFORMATION

This manual is for informational purposes only. Although every effort has been made to ensure the correctness of the information, technical inaccuracies may occur and periodic changes may be made without notice. Net Safety Monitoring Inc. assumes no responsibility for any errors contained within this manual.

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Net Safety Monitoring Inc., products are carefully designed and manufactured from high quality components and can be expected to provide many years of trouble free service. Each product is thoroughly tested, inspected and calibrated prior to shipment. Failures can occur which are beyond the control of the manufacturer. Failures can be minimized by adhering to the operating and maintenance instructions herein. Where the absolute greatest of reliability is required, redundancy should be designed into the system.

Warranty

Net Safety Monitoring Inc., warrants this product for defective parts and workmanship for a period of 24 months from date of purchase of purchase.

No other warranties or liability, expressed or implied, will be honoured by Net Safety Monitoring Inc.

Contact Net Safety Monitoring Inc., or an authorized distributor for details.

We welcome your input at Net Safety Monitoring. If you have any comments please contact us at the phone/address below or visit our web site and complete our on-line customer survey: www.net-safety.com.

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INTRODUCTION

The Universal Solar System (USS) is a compact, near zero maintenance solar power system for locations without primary power. The Universal Solar System (USS) is certified for Class I, Division 2 hazardous locations. All components are the best quality available which yields a system life expectancy of up to 10 years.

THE PRODUCT

The system is simplified and optimized for load less than 0.8 Watts and locations across Canada*. Unlike custom solar systems, the Universal Solar System can be inventoried and moved from one geographic location to another with full confidence. A minimum of 14 or more days of "no sun" operation is assured year round. Temperature compensation charging of the AGM lead-acid photo-voltaic battery is controlled by an active PWM regulator. The regulator includes low voltage, battery protection.

The compact, rugged package includes carrying handles, lifting eyes and mounting flanges for wall or roof locations.

* Larger loads may require additional hardware. Consult your representative or contact Net Safety. For other locations please consult the factory.

THE MANUAL

The manual has been designed to make installation of Net Safety's products easy. To ensure proper installation, follow the simple steps outlined in the following pages. If you encounter problems during operation, consult the troubleshooting section or contact your sales representative.

Step 1 — INSTALL

Step 2 — WIRE

Step 3 — MAINTAIN

Step 4 — TROUBLESHOOT

STEP 1 — INSTALL

UNPACK

Carefully remove all components from the packaging. Check components against the enclosed packing list and inspect all components for obvious damage such as broken or loose parts.

If you find any components missing or damaged, notify the distributor or Net Safety Monitoring immediately.

LOCATE

It is essential to locate the Solar System where it will face due south. It should not be located in shadow during peak sun hours (12 noon, plus or minus 2 hours). We recommend the system be installed a minimum of 2 feet off the ground.

MOUNT

Installation is simplified since the package includes mounting flanges for wall or roof mounting. Ensure unit is securely bolted into position.

Refer to Figure 1, "Universal Solar System", on page 2 for location of mounting flanges.

Optional Accessories

- Pole Mount Bracket
- Roof Swivel/tilt

Refer to "Accessories" on page 7 for part numbers, illustrations and brief instructions.

Figure 1: Universal Solar System

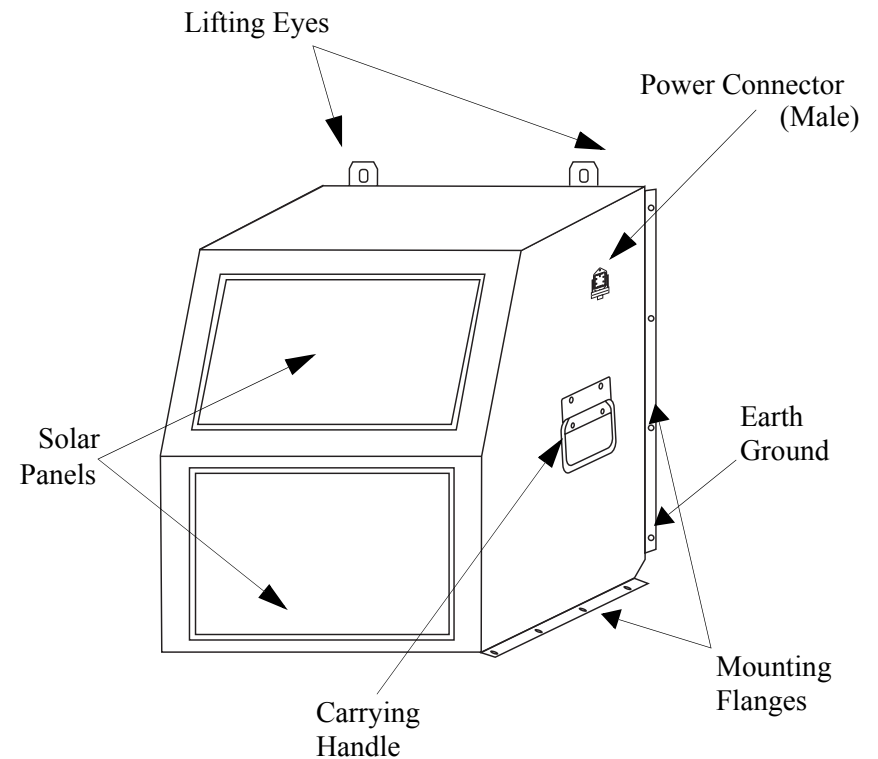
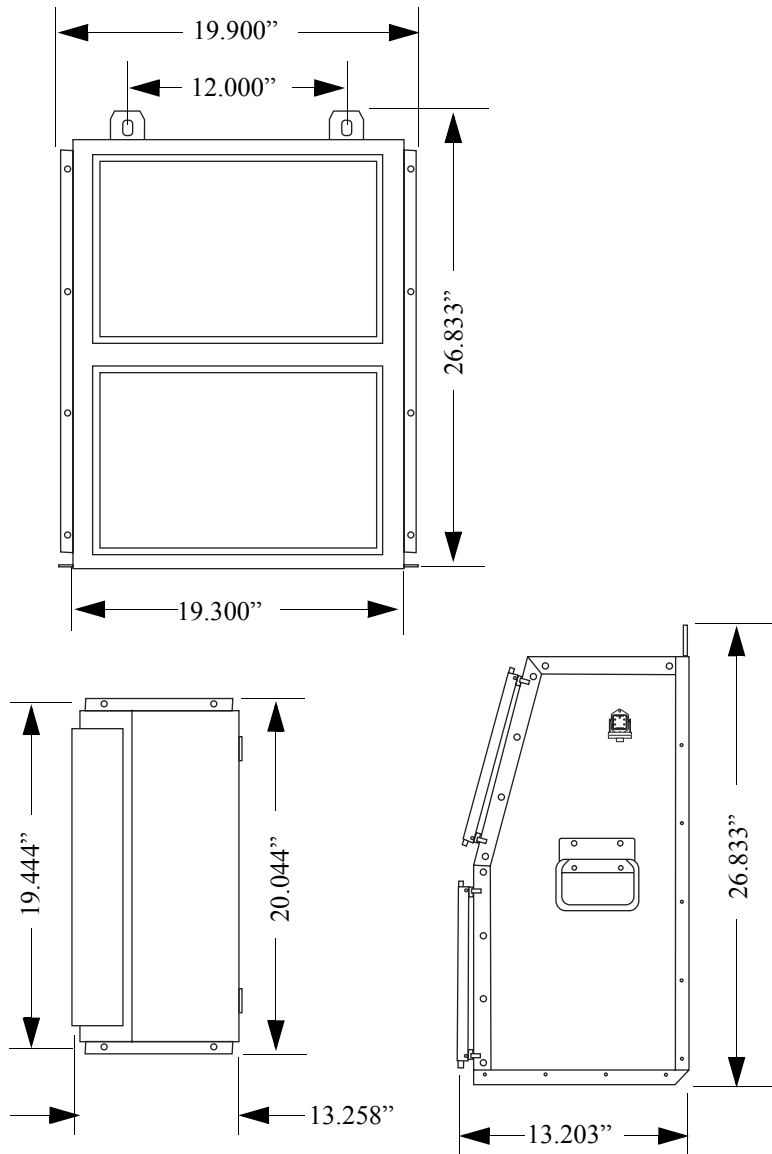


Figure 2: Universal Solar System Dimensions



STEP 2 — WIRE

Note: The wiring procedures in this manual are intended to ensure proper functioning of the device under normal conditions. However, because of the many variations in wiring codes and regulations, total compliance to these ordinances cannot be guaranteed. Confirm that all wiring complies with applicable regulations that relate to the installation of electrical equipment in a hazardous area. If in doubt, consult a qualified official before wiring the system.

The use of shielded cable is highly recommended for power wires to protect against interference caused by extraneous electrical 'noise'.

Water-proof seals are recommended to prevent water accumulation within the enclosure. Seals should be located as close to the device as possible and not more than 18 inches (46 cm) away.

When pouring a seal, use a fibre dam to assure proper formation of the seal. Seals should never be poured at temperatures below freezing.

The jacket and shielding of the cable should be stripped back to permit the seal to form around the individual wires. This will prevent air, gas and water leakage through the inside of the shield and into the enclosure.

Refer to applicable wiring codes when installing and wiring the Universal Solar System.

WIRING INSTRUCTIONS

- Step 1:** Attach either the Metric fitting or Metric to NPT fitting to the Connector Hood.
- Step 2:** Insert the wires from the Power Input through the Connector Hood.

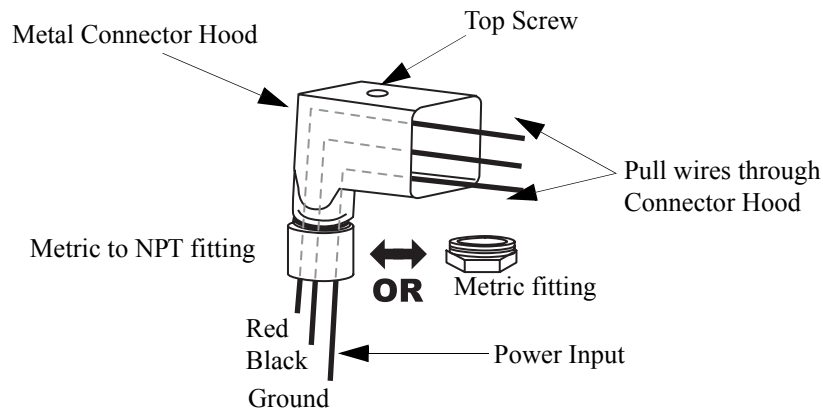
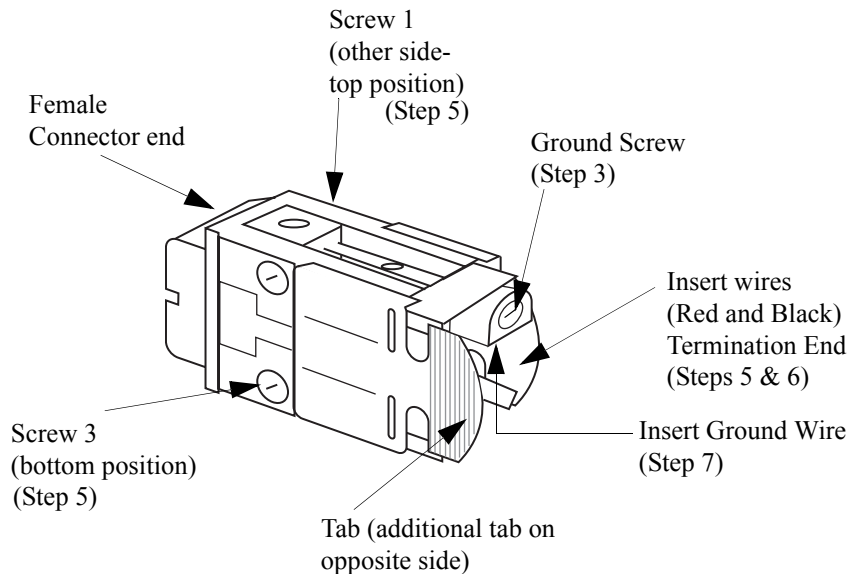
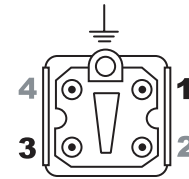



Figure 3: Plastic Connector Details



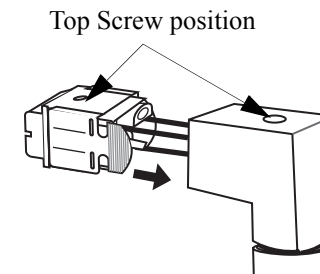
- Step 3:** Loosen Ground Screw on Plastic Connector (two turns).
- Step 4:** Firmly press both Tabs on the Plastic Connector while grasping the Female Connector end—MUST wiggle and pull to open.
- Step 5:** To secure wires, loosen Screws 1 and 3 (found on either side of Plastic Connector).
- Step 6:** Insert Red and Black wires inside Plastic Connector (as per the locations indicated below) and tighten screws.

Termination End
(INSDIE Plastic Connector)



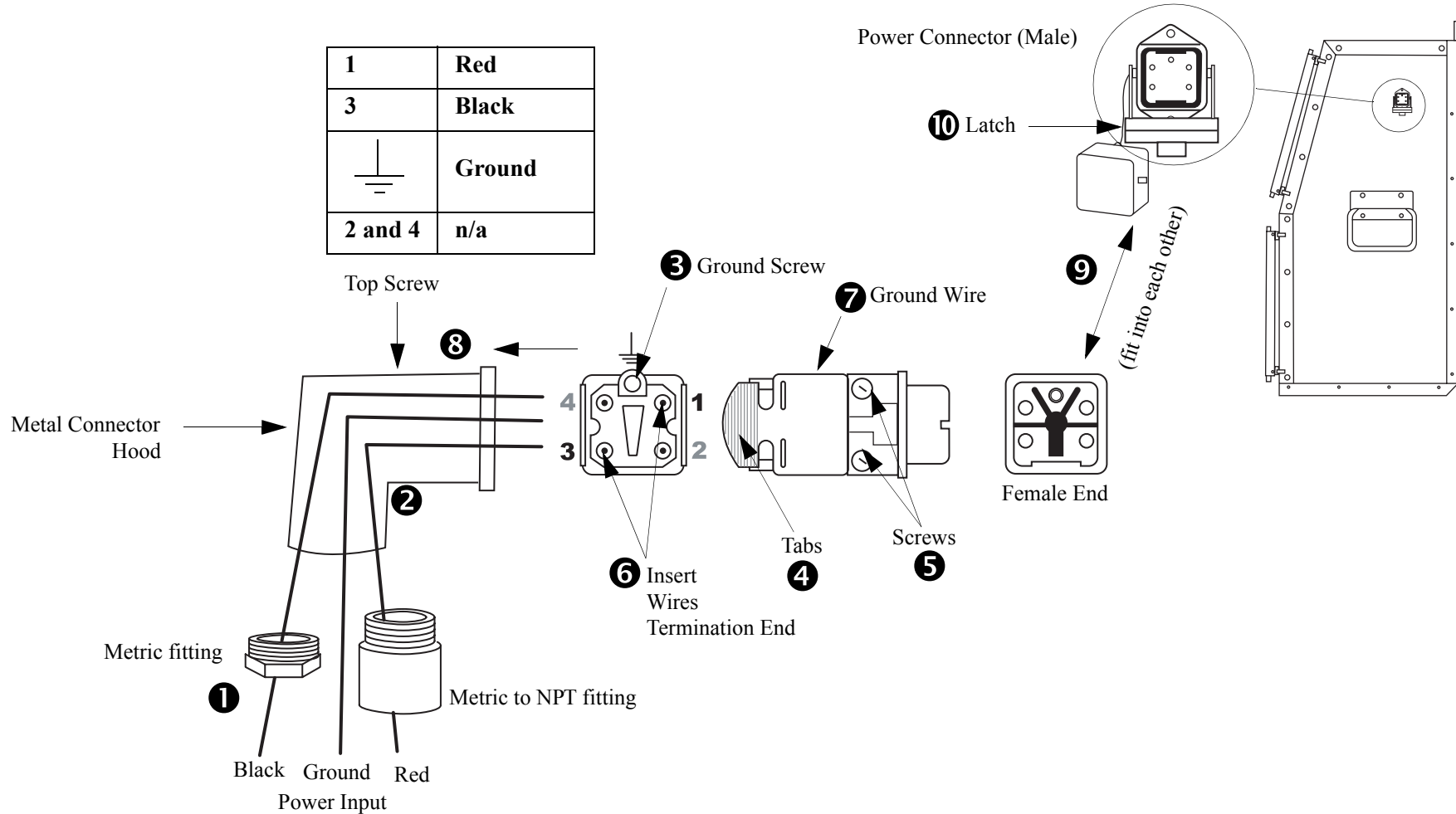
1	Red
3	Black
	Ground
2 and 4	n/a

- Step 7:** Insert ground wire inside and up through hole in Plastic Connector (wire should be flush with top) and tighten screw.
- Step 8:** Once wires attached, close Plastic Connector and slide into the Metal Connector Hood—secure with Top Screw.



- Step 9:** Plug the Female Connector into the protruding Male Power Connector on the side of the Universal Solar System.
- Step 10:** Secure the connection by closing latch.

Figure 4: Wiring Instructions—Reference



Sufficient Charge?

If the Solar unit has been stored for a period of time, it can lose some of its charge. To ensure battery has sufficient charge to carry the load, check to ensure voltage is at least 12.5 V dc. If battery voltage is less than 12.5 V dc, then the Solar unit needs to be exposed to sunlight long enough to restore the battery to 12.5 V dc.

Installation Checklist

Use the following checklist to confirm that all phases of system installation are complete.

- Universal Solar System is securely mounted
- System is facing due south
- System is properly wired and cable shield properly grounded
- Confirmed 12.5 V dc battery voltage (fully charged)
- Water proof conduit seals have been installed at all conduit entries (if conduit is being used)
- Ensure Low Power devices have been set/programmed to low power operation mode

STEP 3 — MAINTAIN

The Universal Solar System is live out of the box.

We recommend checking the system every 3 months. Clean all solar panel surfaces if needed and ensure that there is no continual build up of ice or snow on the panels.

STEP 4 — TROUBLESHOOT

LOW VOLTAGE DISCONNECT

If the load unexpectedly disconnects from the Solar System, sufficient charge may not be available. This may occur if the unit has been stored for a period of time and the battery has discharged. To ensure the Solar System is completely charged and ready to carry the load (battery voltage reads at least 12.5 V dc), expose the Solar unit to full sunlight conditions long enough to charge the battery to 12.5 V dc.

If disconnects persist, then the Solar System may not be receiving sufficient sunlight to ensure a continuous charge—ensure panels receive full sun; avoid shadows falling on panels from 10 am through 2 pm. Another possibility is that the device is drawing too much power (load is too high)—reduce the load. For example, if you have a Low Power Millennium Gas Detector, ensure it is set to low power functionality.

AUTOMATIC LOAD LIMIT

The system is designed for continuous loads of less than 0.8 Watts such as Millennium Low Power toxic gas detectors. Adding additional loads such as normally energized solenoid valves will compromise performance and reliability. The system incorporates an in-line automatically resettable fuse to protect against excessive loads which could discharge the system. Attaching an excessive load will cause automatic disconnection of the power to the load. If the load is reduced to an acceptable level then the load limiter will reset automatically and normal operation will be restored.

RETURN EQUIPMENT

The system is not designed to be repaired in the field. If a problem should develop, please contact the factory for further instruction.

A Material Return Authorization number is required in order to return equipment. Please contact Net Safety Monitoring at **(403) 219-0688** before returning equipment or consult our Service Department to possibly avoid returning equipment.

If you are required to return equipment, include the following information:

1. A Material Return Authorization number (provided over the phone to you by Net Safety).
2. A detailed description of the problem. The more specific you are regarding the problem, the quicker our Service department can determine and correct the problem.
3. A company name, contact name and telephone number.
4. A Purchase Order, from your company, authorizing repairs or request for quote.
5. Ship all equipment, prepaid to:
Net Safety Monitoring Inc
 2721 Hopewell Place NE
 Calgary, Alberta, Canada
T1Y 7J7
6. Mark all packages: **RETURN for REPAIR**

Waybills, for shipments from outside Canada, must state:

Equipment being returned for repair
All charges to be billed to the sender

Also, please ensure a duplicate copy of the packing slip is enclosed inside the box indicating item 1-4 along with the courier and account number for returning the goods.

All Equipment must be Shipped prepaid. Collect shipments will not be accepted.

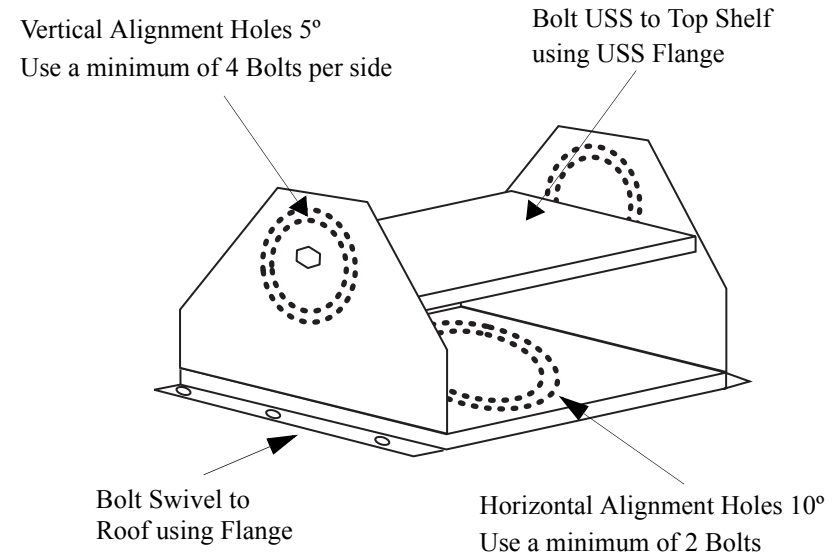
Ensure Solar Panels are well protected when preparing return shipment.

Appendix A: ACCESSORIES

Table 1: Accessories

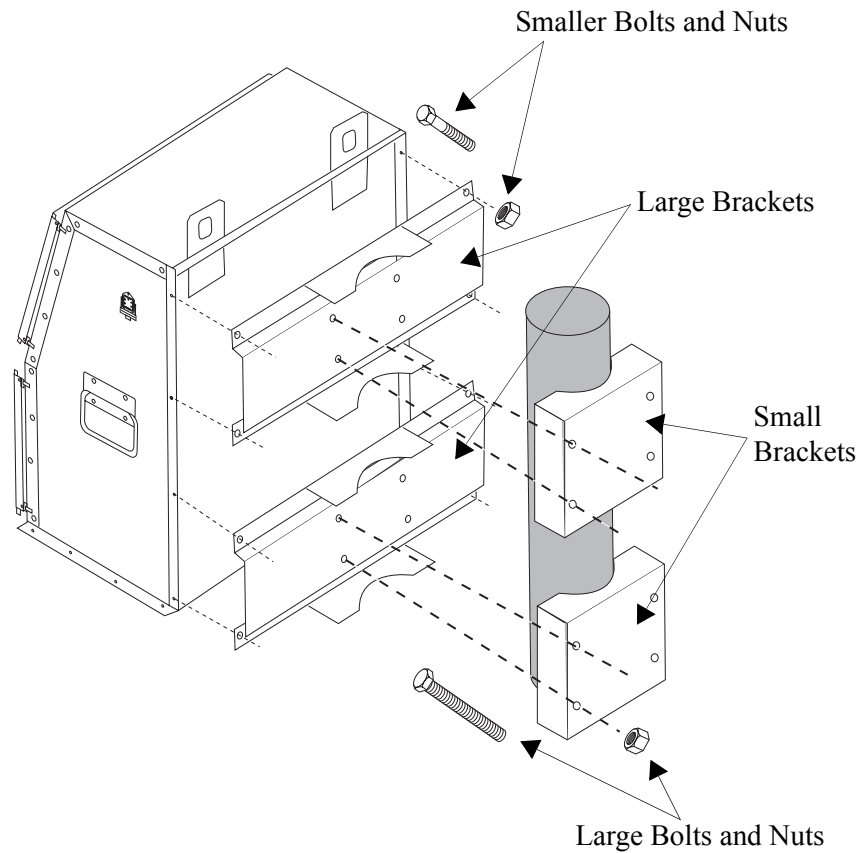
Description	Net Safety Part Number
Universal Solar System Roof Mount Swivel	Solar Roof Swivel (SL9-RS100)
Universal Solar System Pole Mounting Bracket	Solar pole bracket (SL9-PB100)

Figure 5: Roof Mount Swivel



Note: Secure bolts in a parallel alignment pattern.

Figure 6: Pole Mounting Bracket



Pole Mounting

- Step 1:** Attach the Large Brackets to the back of the Solar System.
- Step 2:** Now position the unit against the poll; use the Small Brackets to attach to the Large Brackets.

Appendix B: SPECIFICATION

Operating Power Voltage Range:

12 V dc (24 V dc optional) <66 mA

Operating Temperature Range:

-40°C to +72°C (-40F to +167F)

Nominal Solar Power:

20 W

Certifications:

Certified to CSA standards for hazardous locations,
Class I, Division 2, Groups C and D. T3. NEMA 3R IP56

Battery:

Valve regulated, sealed lead acid photo-voltaic rated 104 AH

Life Expectancy:

up to 10 years continuous use

Weight:

63.4 Kg (140 lb)

Load:

less than 0.8 Watts

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