

Installation Guide

115W Solar Max Flex Panel

Model Number: 784-9115-01

115W Solar Max Flex Slim Panel

Model Number: 784-9115S-01

220W Solar Max Flex Panel

Model Number: 784-9220-01

330 Solar Max Flex Panel

Model Number: 784-0330

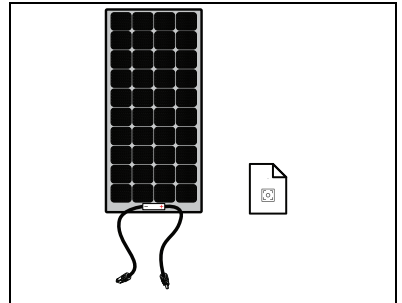
NOTE: Actual product may be different from what is shown.

Thank you for purchasing the Xantrex Solar Max Flex Panel. The Xantrex Solar Max Flex Panel is a high quality, carbon emissions-free, and sustainable power source for your vehicle such as, recreational vehicle (RV), truck, or boat. It is designed to take solar energy and quietly produce power for your vehicle's DC appliances and store energy to a battery during daylight hours.

The Solar Max Flex Panel base package includes the following items:

- one Solar Max Flex Panel
- one Product Notice with a link to this Installation Guide

NOTE: If any of the accessories, materials, and other items are missing, contact Xantrex or any authorized Xantrex dealer for replacement. See *Contact Information* on the back cover.



The following Xantrex accessories are available to complete your solar system and are sold separately:

- Solar and Battery Cables Starter Kit (PN: 708-0150)
- PWM 30A Charge Controller (PN: 709-3024-01)
- MPPT 30A Charge Controller (PN: 710-3024-01)
- MPPT Remote Display (PN: 710-0010)

Safety Information

Important Information

READ AND SAVE THIS INSTALLATION GUIDE FOR FUTURE REFERENCE.

Read these instructions carefully and look at the equipment to become familiar with the device before installing, operating, configuring, maintaining, and troubleshooting it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.














The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Product Safety Information

-  Before using the solar max flex panel, read all instructions and cautionary markings on the solar max flex panel's components, the batteries, and all appropriate sections of this guide.
-  Use of accessories not recommended or sold by the manufacturer may result in injury to persons, a risk of electric shock, or a risk of fire.
-  The solar max flex panel is designed to be connected to your DC electrical systems. The manufacturer recommends that all wiring be done by a certified PV technician or electrician to ensure adherence to the local and national electrical codes applicable in your jurisdiction.
-  To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the solar max flex panel with damaged or substandard wiring.
-  Do not operate the solar max flex panel if it has been damaged in any way.
-  This solar max flex panel does not have any user-serviceable parts. Do not disassemble the solar max flex panel except where noted for connecting wiring and cabling. See your warranty for instructions on obtaining service. Attempting to service the solar max flex panel yourself may result in a risk of electrical shock or fire.
-  To reduce the risk of electrical shock, disconnect the solar max flex panel from all devices and/or components before attempting any maintenance or cleaning on the solar max flex panel.
-  To reduce the chance of short-circuits, always use insulated tools when installing or working with this equipment.
-  Remove personal metal items such as rings, bracelets, necklaces, and watches when working with electrical equipment.
-  Do not ground any PV conductors.
-  Do not install the solar panel on top of a residential structure.

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Exclusion for Documentation

UNLESS SPECIFICALLY AGREED TO IN WRITING, SELLER

(A) MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN ITS MANUALS OR OTHER DOCUMENTATION;

(B) ASSUMES NO RESPONSIBILITY OR LIABILITY FOR LOSSES, DAMAGES, COSTS OR EXPENSES, WHETHER SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL, WHICH MIGHT ARISE OUT OF THE USE OF SUCH INFORMATION. THE USE OF ANY SUCH INFORMATION WILL BE ENTIRELY AT THE USER'S RISK; AND

(C) REMINDS YOU THAT IF THIS MANUAL IS IN ANY LANGUAGE OTHER THAN ENGLISH, ALTHOUGH STEPS HAVE BEEN TAKEN TO MAINTAIN THE ACCURACY OF THE TRANSLATION, THE ACCURACY CANNOT BE GUARANTEED. APPROVED CONTENT IS CONTAINED WITH THE ENGLISH LANGUAGE VERSION WHICH IS POSTED AT <http://www.xantrex.com>.

NOTE: Visit <http://www.xantrex.com>, click Products, select a Product category, select a Product, and search the Product Documents panel for a translation of the English guide, if available.

Contact Information

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Email: customerservice@xantrex.com,

<https://xantrex.com/support/get-customer-support/>

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Basic Installation Steps

Safety Instructions

Before beginning your installation:

- Read this entire Installation section so you can plan the installation from beginning to end.
- Assemble all the tools and materials you require for the installation.
- Be aware of all safety and electrical codes which must be met.

⚠WARNING

ELECTRICAL SHOCK AND FIRE HAZARD

- The power system must be designed by a certified vehicle solar system designer and installed by a certified solar system technician.
- All wiring should be done by qualified personnel to ensure compliance with all applicable installation codes and regulations.
- Disconnect all power sources.
- Disable and secure disconnect devices.

Failure to follow these instructions can result in death, serious injury, or equipment damage

Tools and Materials

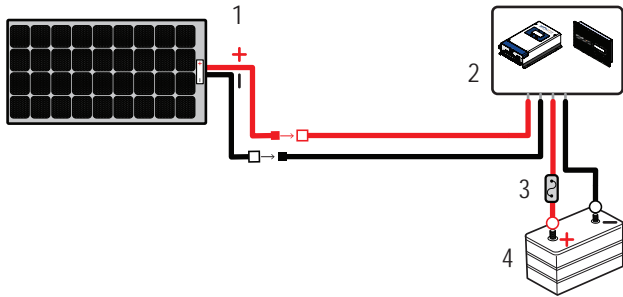
You may need the following tools to install the Solar Max Flex Panel:

- Wrench set
- Torque driver
- 2"-wide 3M 4411 Extreme Sealing Tape

1. Plan the power system and where to mount the solar panel.

- a. The Xantrex Solar Max Flex Panel comes in the following power levels: 115 W standard, 115 W slim, 220 W, and 345 W
- b. Draw your power system on paper similar to *Figure 1*.

Figure 1 Cable Schematic



| | | | |
|---|--|---|---------------------------------|
| 1 | Solar panel See section on Solar Panel Wiring for more information. | 3 | DC fuse (or battery disconnect) |
| 2 | Charge controller (PWM or MPPT) See section on Solar Panel Wiring for more information. | 4 | Battery (12V or 24V) |

2. Plan where to mount the charge controller, fuses, and cable locations.

- a. Identify and gather information about your vehicle.
 - Some vehicles are factory-installed with roof cable entry points.
 - If a cable entry point is absent, factory-installed vents can be used to route cables through.
- b. Locate a suitable location for the charge controller inside the vehicle. Select an area that is readily accessible, viewable, and free from exposure to moisture.
- c. Plan the route and measure the lengths of cables needed to reach their connection points factoring in bends and slack.
- d. You may add additional solar panels. For more information, see *Solar Panel Wiring on page 11*.

WARNING

ELECTRIC SHOCK AND FIRE HAZARD

Do not ground any PV conductors.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

PWM 30A Charge Controller (PN: 709-3024-01)



MPPT 30A Charge Controller (710-3024-01)



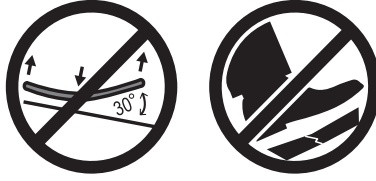
3. Mount the solar panel.

TIP: Once applied to a surface, the 3M™ VHB™ tape, which is a high-strength, double-sided acrylic adhesive tape, cannot be easily removed without damaging both the solar panel and the mounting surface. For more information, visit the 3M website.

IMPORTANT: Follow the recommendations illustrated in Figure 2 and succeeding Figures.

- Unpack the solar panels and prepare all installation tools and materials.
- Prepare the roof mounting surface by removing dust, dirt, and debris. Clean and degrease the roof surface with isopropyl alcohol and dry completely.

Figure 2 Precautions



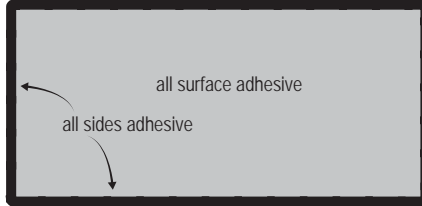
NOTICE

GENERAL PRECAUTIONS

- Do not bend more than 30° when handling and mounting the solar panel.
- Do not step on the solar panel.
- Do not mount the solar panel near other roof fixtures that can obstruct direct exposure to sunlight.
- Select the mounting area carefully and mark the exact and intended location of the solar panel.

Failure to follow these instructions can result in physical damage to vehicles and property.

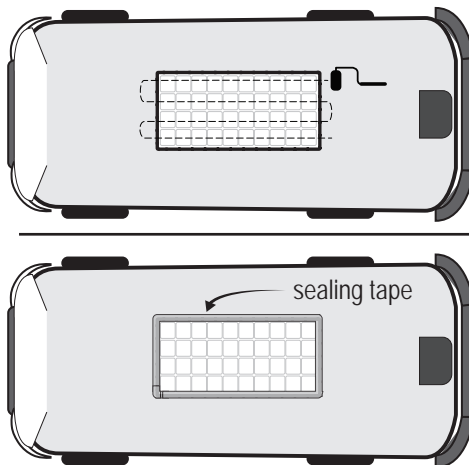
Figure 3 Adhesive strips on the panel's backside



The backside of the Solar Max Flex Panel has 3M VHB tape strips already applied around the perimeter of the panel.

- Peel off the liner film from the 3M VHB tape and place the Solar Max Flex Panel on the exact and intended location. It is ideal to have two people to carefully and accurately mount the solar panel.
- Apply even pressure only on top of the areas where there is the 3M VHB tape underneath the solar panel for proper bonding of the 3M VHB tape to the mounting surface. It is ideal to use a roller or the palm of your hands to apply pressure.
- Be careful not to apply hard pressure on the solar cells that may lead to damage.
- Use a 2"-wide 3M 4411 Extreme Sealing Tape to apply all around the perimeter edge of the panel for a tighter seal. See Figure 4 for an illustration.

Figure 4 Adhesive placement depending on surface



For illustration purposes. The solar cells are shown as perspective only. Do not apply the adhesive tape on top of the solar cells. The adhesive tape must be applied on the back side of the panel and onto the mounting surface.

4. Connect the DC cables.

NOTICE

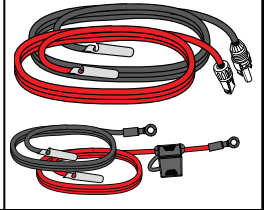
REVERSE POLARITY

Check polarity at all terminals before making the final DC connection. POS(+) (red) must connect to charge controller POS(+) (red); NEG(-) (black) must connect to charge controller NEG(-) (black).

Failure to follow these instructions can result in equipment damage.

- Cover the solar panel with a blanket (or the packaging box) to de-energize it.
- Connect the red pos (+) and black neg (-) PV cables to the solar panel using the MC4-type connectors.

Solar and Battery Cables Starter Kit 10 AWG, 20-ft PV cables, 10-ft battery cables (PN: 708-0150)



T3:

Torque
10.6 lb-in
1.2 N-m



- Route the PV cables through the roof entry point and connect the red pos (+) and black neg (-) PV cables to the charge controller. See **T3**.
- Connect the red pos (+) and black neg (-) battery cables to the charge controller. See **T3**.
- Route the battery cable inside the vehicle and connect the red pos (+) and black neg (-) battery cables to the respective battery terminals.
- Secure all cables with clamps (and/or cable ties) and additional strain-relief as necessary.
- Clear the roof and the cable routes of tools and other debris that may have been left during installation.

5. Operate and maintain the system.

- Remove the blanket (or the packaging box) covering the solar panel to start energizing the solar panel.
- Refer to *Solar Panel Maintenance and Care* on page 13 for best practices.

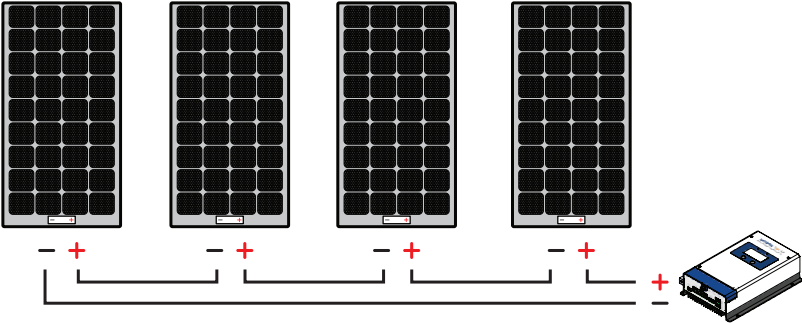
Solar Panel Wiring

- a. Depending on your power needs and installation type, you have two kinds of solar charge controllers available.

| Solar Charge Controller | Amp | Output Voltage | Part Number |
|------------------------------|-----|----------------|-------------|
| Pulse width modulation | 30A | 12/24VDC | 709-3024-01 |
| Maximum power point tracking | 30A | 12/24VDC | 710-3024-01 |

- b. Solar panels can be configured in series, parallel, or a combination of both series and parallel.

Figure 5 Cable schematic for series

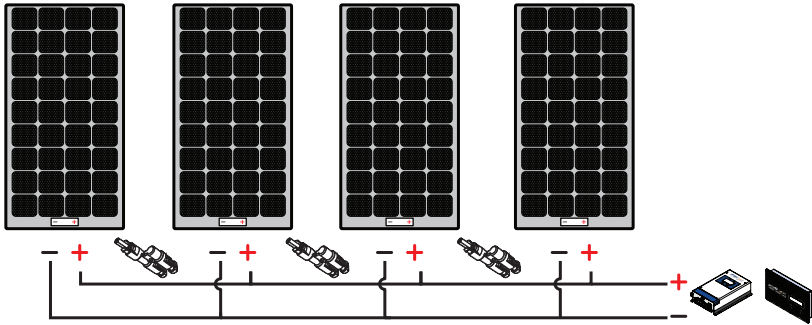


Pos (+) of first panel connects to Neg (-) of next panel and so on and terminating with the Pos (+) of the solar charge controller.

Neg (-) of first panel extends to Neg (-) terminal of the solar charge controller.

Optimized for MPPT solar charger.

Figure 6 Cable schematic for parallel

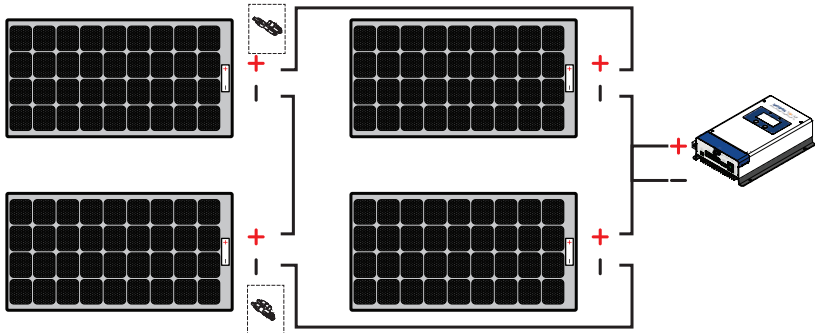


Pos (+) of first panel connects to Pos (+) of next panel using branch connectors and so on and terminating with the Pos (+) of the solar charge controller.

Neg (-) of first panel connects to Neg (-) of next panel using branch connectors and so on and terminating with the Neg (-) of the solar charge controller.

Optimized for MPPT or PWM solar charger.

Figure 7 Cable schematic for combination



One set of panels connect in series to form one string and so on.

Two or more strings connect in parallel.

Optimized for MPPT solar charger.

Solar Panel Maintenance and Care

Although a well designed vehicle-mounted solar system requires minimal maintenance, it is highly recommended to perform an inspection and cleaning of the solar panels during the warranty period. This helps to ensure optimal system performance and reliability through a few simple steps.

Visual Inspection Perform a visual inspection of the solar system on a monthly basis to identify if there are any visual defects or improper connections.

- Check for any sharp objects on the solar panel surface.
- Check for any signs of corrosion or burnt hotspots around the solar cell and backsheet area.
- Check that the solar panel is clear of any shading by any foreign material or unwanted obstacles. Just a small amount of shade on the solar panel surface can cause significant power output loss.
- If the solar panel has slight discoloration over a period of usage, this is considered normal for solar panels that use an anti-reflection coating laminate.

Cleaning Solar Panels The power output of a solar panel is proportional to the amount of sunlight that reaches the solar cells. Therefore, any build-up of dust or dirt on the surface of the solar panel will result in a loss of power. This is a trade-off between the maximizing the power output of the solar panel versus the cost and time to perform regular cleaning.

⚠ Do not clean solar panels if there is broken glass or exposed wiring because this creates a risk for electric shock.

⚠ Do not step or kneel on the solar panel during cleaning.

- Check the solar panel periodically during seasons that the vehicle is in-use. If there is a build-up of dust or dirt on the surface of the solar panel, it is recommended to clean it.
- Clean the solar panel in the early morning or early evening when the solar panel is cooler, especially in hot regions. This will reduce the risk for electrical and thermal shock.
- Clean using a soft cloth together with clean water and mild detergent or soap.
 - Avoid solutions containing hydrochloric acid, D-Limonene, ammonia, or sodium hydroxide.
 - Make sure there is no soap residue remaining after cleaning.
 - Avoid using water with high mineral content that may leave deposits on the solar panel surface.
 - Tap water with low mineral content or deionized water may also be used.
 - Use fresh water with TDS < 1500 mg/l for cleaning.
 - Do not use abrasive materials to clean the solar panel.
 - Do not use chemicals to clean the solar panel.
 - Do not pressure wash the solar panel.
 - Do not clean or spray water at the Junction Box.

Frequency

- Trim vegetation that shades the solar array.
- Verify that mounting hardware is properly tightened.
- Inspect cables for tight connections and protection from sunlight and water.
- Check string fuses in each non-earthed pole.
- Check the torque of terminal bolts and the general condition of wiring at least twice a year.
- Use replacement modules of the same type and handle live parts with caution.
- Ensure modules are not shaded, as shaded cells produce less energy.

Diodes Inspection PV modules come equipped with bypass diodes in the junction box to minimize heating and current losses. Do not attempt to open the junction box to change the diodes if they malfunction, as it can pose electrical hazards and void the module's warranty.

Battery System If your system uses a battery, consider placing blocking diodes between the battery and the PV module output to prevent battery discharge at night.

- Additional Checks**
- Cleaning frequency depends on environmental conditions; high windy or dusty areas may require more frequent cleaning.
 - For excessive soiling, use a non-conductive soft brush or sponge before using water.
 - Cleaning should be done by trained personnel who understand the risks of applying water to electrical components.
 - Wear safety gloves and appropriate electrical insulation PPE during cleaning or inspection.
 - Clean modules during dusk to dawn to avoid generation time.
 - Perform maintenance at least once a year by trained personnel with safety gear.

Troubleshooting

WARNING

ELECTRICAL SHOCK HAZARD

If the in-line fuse on the 10AWG positive (+) battery cable blows, replace with a 30A/32V green ATC blade fuse.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: To obtain service go to *Contact Information on page 1.*

| Problem | Possible Cause | Solution |
|---|--|--|
| Battery does not get charged even when sunlight is present. | Solar panel is partially shaded or there is insufficient sunlight. | Move the vehicle or vessel so the whole solar panel is exposed to direct sunlight. |
| | Loose or no DC cable connections. | Connect DC cables to the battery and solar panel and tighten terminal connections. |
| | Fuse is blown. | Replace the blown fuse with a 30A/32V green ATC blade fuse. |

Specifications

NOTE: Specifications are subject to change without prior notice.

115W Solar Max Flex Panel

| | |
|------------------------|--|
| Part number | 784-9115-01 |
| Dimensions | 37.5in x 28.4in x 0.08in (953mm x 722mm x 2mm) |
| Unit weight | 6.0 lbs.(2.7 kg) |
| Cell Type | Monocrystalline PERC |
| Maximum power at STC* | 115 W |
| Maximum power voltage | 22.1 V |
| Maximum power current | 5.2 A |
| Open circuit voltage | 27.4 V |
| Short circuit current | 5.6 A |
| Maximum system voltage | 600 VDC |
| Safety | Class III PV Module |

* Standard Test Conditions(STC): Irradiance: 1000W/m², Cell Temperature: 25°C, Air Mass: 1.5

115W Solar Max Flex Slim Panel

| | |
|------------------------|--|
| Part number | 784-9115S-01 |
| Dimensions | 70.3in x 15.3in x 0.08in 1789mm x 390mm x 2mm |
| Unit weight | 6.1 lbs.(2.8 kg) |
| Cell Type | Monocrystalline PERC |
| Maximum power at STC* | 115 W |
| Maximum power voltage | 22.1 V |
| Maximum power current | 5.2 A |
| Open circuit voltage | 27.4 V |
| Short circuit current | 5.6 A |
| Maximum system voltage | 600 VDC |
| Safety | Class III PV Module |

220W Solar Max Flex Panel


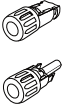
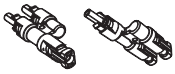

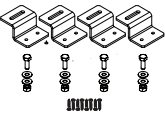

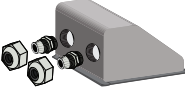




| | |
|------------------------|---|
| Part number | 784-9220-01 |
| Dimensions | 74.7in x 25.3in x 0.08in 1948mm x 645mm x 2mm |
| Unit weight | 11.6 lbs.(5.3 kg) |
| Cell Type | Monocrystalline PERC |
| Maximum power at STC* | 220 W |
| Maximum power voltage | 20.9 V |
| Maximum power current | 10.4 A |
| Open circuit voltage | 25.8 V |
| Short circuit current | 11.2 A |
| Maximum system voltage | 600 VDC |
| Safety | Class II PV Module Insulate leads and connections accordingly |

330W Solar Max Flex Panel

| | |
|------------------------|---|
| Part number | 784-0330 |
| Dimensions | 71.6in x 41.5in x 0.08 in (1818mm x 1054mm x 2mm) |
| Unit weight | 16.7 lbs.(7.6 kg) |
| Cell Type | Monocrystalline PERC |
| Maximum power at STC* | 330 W |
| Maximum power voltage | 36.9 V |
| Maximum power current | 9.0 A |
| Open circuit voltage | 43.8 V |
| Short circuit current | 9.7 A |
| Maximum system voltage | 600 VDC |
| Safety | Class II PV Module Insulate leads and connections accordingly |

* Standard Test Conditions(STC): Irradiance: 1000W/m2, Cell Temperature: 25°C, Air Mass: 1.5

Accessory List

| Accessories (Sold Separately). Contact a Xantrex authorized dealer to order. | | | |
|---|---|---|--|
| <p>PV Extension Cables 10AWG, 15-ft (PN: 708-0030)</p>  | <p>30A PV Single Connector (PN: 708-0040)</p>  | <p>30A PV Branch Connector (PN: 708-0050)</p>  | <p>PV Connector Assembly Tool (PN: 708-0060)</p>  |
| <p>Mounting Hardware (PN: 708-0070)</p>  | <p>Remote Battery Temperature Sensor (PN: 708-0080)</p>  | <p>Roof-Entry Cable Plate (PN: 708-0090)</p>  | <p>Solar and Battery Cables Starter Kit 10 AWG, 20-ft PV cables, 10-ft battery cables (PN: 708-0150)</p>  |
| <p>PWM 30A Charge Controller (PN: 709-3024-01)</p>  | <p>MPPT 30A Charge Controller (PN: 710-3024-01)</p>  | <p>MPPT Remote Display (PN: 710-0010)</p>  | |

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