



# Instruction Manual

## 2 Watt Maintainer and 6 Watt Trickle Charger/Maintainer SOLAR PANEL KITS

A: You can trickle charge all types of 12V batteries with the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099), including lead-acid automotive batteries, deep cycle (transaction type) batteries, gel-cell batteries and heavy-duty (stationary type) batteries.

Q: How long will it take for the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) to charge a dead battery?

A: The FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) is designed to trickle charge batteries. It compensates for natural voltage losses and key-off small instrumentation drain by replenishing your battery. This solar panel can generate 6 watts of power per hour, which is equal to 500mA of current under ideal conditions. For example, under ideal conditions, the panel will generate 6 watts x 7 hours x 7 days per week for a total of 294 watts of power.

Q: Do I need a charge controller with the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099)?

A: No, a charge controller is not required for the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) because it is not powerful enough to overcharge your battery.

Q: Can the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) drain my battery at night?

A: No. FulTyme RV 6 watt solar panels are equipped with a built-in diode that prevents any reverse current.

Q: Can the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) be left outdoors without protective covering?

A: Yes, the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) has been weather protected and can be mounted outdoors. It is weather-proofed, and can withstand small hail, up to 180° F heat, and operate under 3 inches of snow (on sunny days).

Q: Can I mount the FulTyme RV 6 watt Trickle Charger/Maintainer (Model 3099) directly to a surface or do I need to use some sort of bracket?

A: FulTyme RV 6 watt solar panels can be installed directly to a flat surface, using the brackets and screws provided.

Q: Can I extend the wire?

A: Without loss of power or voltage, the 8' 8" wire may be extended to a maximum length of 25' with 16 gauge wire. Ensure proper connections.

Q: Can I start/drive my vehicle with the FulTyme RV Model 3099 connected to the cigarette lighter socket (12 volt lighter adapter) or battery?

A: No. For safety reasons please make sure the panel is not in use while you are driving your vehicle.

Q: How do I know if the panel is working?

A: Use a voltmeter to measure the voltage of the panel. The voltage reading should be between 16 and 25 Volts in full sun. This number will continually fluctuate as the strength of the sun is constantly changing.

### TROUBLESHOOTING

Problem: My panel is not functioning. Ensure that the distance of the wires is not longer than 25' and all connections are secure. Ensure battery is operational.



# Instruction Manual

## 2 Watt Maintainer and 6 Watt Trickle Charger/Maintainer SOLAR PANEL KITS



Model 3098  
MAINTAINER 2W



Model 3099  
TRICKLE CHARGER/MAINTAINER 6W

### IMPORTANT!

Please read the instructions before operating and before and during the use of this product.

- It is important to observe and follow industry standard and manufacturer's safety procedures when working around batteries and other electrical equipment. Again, when working around batteries and other electrical equipment, please observe industry standard and manufacturer's safety procedures.
- To reduce the risk of electrical sparking when installing these solar chargers, please use a thick fabric to cover the panels, ensuring the panels are producing very little charge, or do the installation in low light conditions.
- Ensure that you are making connections in a well-ventilated area free from flammable gases or vapors.
- These panels are designed for 12 Volt battery configurations only.
- For 12 V systems, ALL connections should be in PARALLEL: Positive (+) to Positive (+), Negative (-) to Negative (-).
- DO NOT attempt to recharge NON-RECHARGEABLE batteries, as an example NiMh batteries.
- When disconnecting your solar panel, DISCONNECT the battery LAST.

### General Product Description

These panels capture the energy of the sun to generate power that can charge a 12 Volt battery for small power applications such as lighting systems or any small appliance.

The battery bank is an important component of any off-grid solar charging system, and we suggest using a deep-cycle battery. A 12 Volt battery is not included in this kit and is sold separately.

**Please note:** A full battery has a voltage of 12.8 Volts. Never deeply discharge your battery; never let your battery voltage pass 11.0 volts. It will cause permanent damage to the battery. Use a DMM (Digital Multi-Meter) to measure your battery's voltage.

## 2 watt Maintainer (Model 3098)

Specifications and included items:

Power Rating: Up to 2 watts

Current: Up to 166 mAmps @ 12 Volts.

Includes: Alligator Clamps, 12 Volt DC Plug, 8' 8" Wire, Tilting Rods, Voltage Indicator

### Installation

#### Installation through 12 Volt DC Plug:

Plug the included 12VDC Plug into the 12 Volt DC socket (cigarette lighter socket) in vehicle. Make sure both ends are secure and aligned correctly. For optimal power, ensure the panel (solar cell up) is directly facing the sun.

#### Installation to Battery with Alligator Clamps:

Connect the included alligator clamps correctly by matching the red clamp which is Positive (+) to the Positive (+) terminal on your battery. Connect the black Clamp which is Negative (-) to the Negative (-) Terminal on your battery.

**WARNING: Follow this carefully to not cause any bodily harm. Wrong connections may cause sparking or explosion.**

For optimal power, ensure the panel (with the solar cell facing up) is directly facing the sun.

Positioning the Solar Panel:

Can be laid flat on a surface or if needed, there are (2) tilting rods supplied to keep the panel at an angle. These rods screw into the back of the frame which allows the panel to be positioned at various levels for best results.

### NOTE:

This solar panel has a built in blocking diode to prevent "reverse discharge". Please do not use this panel while vehicle is in use. When operating your vehicle, it is best to secure the solar panel in the glove box or in another secure location. This solar panel is not weatherproof. If panel is weathered, the warranty will become void. Unit can be reasonably weatherproofed by using clear silicone caulking around the edges of the glass frame and around the plugs to block moisture for periods of time, but is not to be permanently affixed to the outside of the vehicle. Many windshields have UV blocking, which would cause the solar panel not to function properly. Also keep note window tint on side windows will also prevent the solar panel from absorbing sufficient energy to function properly.

## FREQUENTLY ASKED QUESTIONS

**Q:** Will the FulTyme RV 2 watt Model 3098 keep my vehicle battery maintained?

**A:** The FulTyme RV 2 watt Model 3098 compensates for natural voltage losses and key-off small instrumentation drain by replenishing and maintaining your battery up to a maximum rate of 166mAmps in full sunlight.

**Q:** What types of batteries can I maintain?

**A:** You can maintain all types of rechargeable 12V batteries including automotive batteries, deep cycle (traction) batteries, gel-cell batteries, and heavy-duty (stationary) batteries.

**Q:** Can the FulTyme RV 2 watt Model 3098 drain my battery at night?

**A:** No. FulTyme RV 2 watt Model 3098 solar panels are equipped with a built-in diode, which prevents reverse current.

**Q:** Can I overcharge my battery with the FulTyme RV 2 watt Model 3098?

**A:** The FulTyme RV 2 watt Model 3098 will not overcharge a vehicle battery.

**Q:** Can I start or drive my vehicle with the FulTyme RV 2 watt Model 3098 connected to the cigarette lighter socket (12 volt lighter adapter) or battery?

**A:** No. For safety reasons please make sure the panel is not in use while you are using your vehicle.

**Q:** Can the FulTyme RV 2 watt Model 3098 be left outdoors?

**A:** No. This solar panel is not weatherproof. If this solar panel is weathered the warranty will become void.

**Q:** Will the FulTyme RV 2 watt Model 3098 always charge the battery through the cigarette lighter socket (12 volt lighter adapter)?

**A:** In some vehicle models, the cigarette lighter socket (12 volt lighter adapter) is inactive while the vehicle is off. Please consult your car owner's manual. In the event that your car presents this limitation, use the battery clamps provided with the unit in order to connect it directly to your battery.

**Q:** How do I know if the panel is working?

**A:** Use a voltmeter to measure the voltage of the panel. The voltage reading should be between 16 and 25 Volts in full sun.

**Q:** The blue LED does not light up on the supplied Voltage Indicator?

**A:** If the blue LED is not lit, it may mean that you are not exposing the unit to enough daylight. Please position the solar panel to maximize its exposure to the sun. In rare instances the LED indicator may have burned out yet the panel is still working effectively. You can test the solar panel's output with a voltmeter.

**Q:** Do I need a charge controller?

**A:** No, a solar battery charge controller is only needed for panels of 16 watts or greater.

## Trickle Charger/Maintainer (Model 3099)

Specifications and Included Items:

Power Rating: Up to 6 watts

Current: Up to 500mAmps @ 12 Volts

Includes: Solar Panel, 12 Volt DC Plug, Alligator Battery Clamps, 8' 8" Wire, (4) Steel Mounting Brackets, Tilting Rods, Voltage Indicator

### Installation

Securely place the solar panel in the sun. Included mounting brackets and screws can be used if necessary for permanent installation. Tilting rods are also supplied positioning the solar panel at an angle.

#### Installation Through 12 Volt DC Plug:

Plug the included 12VDC Plug into the 12 Volt DC socket (cigarette lighter socket) in the vehicle. Make sure both ends are secure and aligned correctly. For optimal power, ensure the panel (solar cell facing up) is directly facing the sun.

#### Installation to Battery with Alligator Clamps:

Connect the included alligator clamps correctly by matching the red clamp which is Positive (+) to the Positive (+) terminal on your battery. Connect the black Clamp which is Negative (-) to the Negative (-) Terminal on your battery.

**WARNING Follow this carefully to not cause any bodily harm. Wrong connections may cause sparking or explosion.**

For optimal power, ensure the panel (with the solar cell facing up) is directly facing the sun.

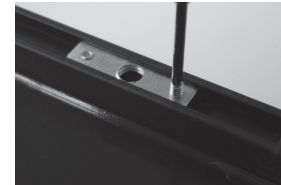
### NOTE:

This solar panel has a built in blocking diode to prevent reverse discharge. Please do not use this panel while vehicle is in use. When operating your vehicle it is best to secure the solar panel in the glove box or in another secure location.

**BRACKET INSTALLATION** - To install the mounting brackets, please follow the below instructions.

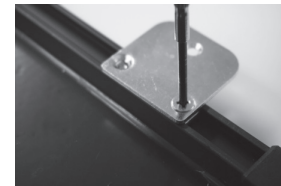
#### Step 1

Remove the screws from the silver bracket on the back side of the solar panel as shown in the picture. This will require a small Phillips head screwdriver. The screws that are removed will not be needed to fasten the bracket



#### Step 2

Line up the bracket's two holes over the solar panel bracket's holes and use the supplied Flush Head screws to secure the bracket to the panel.



#### Step 3

Repeat these steps for the other three remaining brackets if required.

## FREQUENTLY ASKED QUESTIONS

**Q:** What types of batteries can I charge?