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## Battery Tender 021-1162

# Battery Tender 5-45 Watt Automatic Solar Panel Controller

Model: 021-1162

Brand: Battery Tender

### INTRODUCTION

This manual provides comprehensive instructions for the safe and effective use of your Battery Tender 5-45 Watt Automatic Solar Panel Controller, Model 021-1162. This device is designed to efficiently charge and maintain 12-volt batteries using a solar panel (solar panel not included). It features advanced 3-stage charging technology to optimize battery health and longevity.

### SAFETY INFORMATION

Please read and understand all safety warnings and instructions before operating this device. Failure to do so may result in injury or damage to the product or property.

- Always connect the battery to the charge controller first, and disconnect the battery last.
- Ensure correct polarity (+ to + and - to -) when connecting the solar panel and battery to the controller. Incorrect connections can damage the device and battery.
- This controller is designed for 12-volt lead-acid batteries (Wet, Gel, AGM). Do not attempt to charge other battery types unless explicitly stated.
- Use only solar panels within the specified wattage range (5W - 45W) and voltage limits (max input voltage 32 VDC).
- The controller is not waterproof. Protect it from moisture, rain, and direct water exposure.
- Do not disassemble or modify the controller. Refer all servicing to qualified personnel.
- Ensure adequate ventilation around the controller during operation.
- Keep out of reach of children.

The controller includes built-in protection against reverse connection, overvoltage, short circuit, and over temperature to enhance safety.

## PRODUCT OVERVIEW

### Features:

- **Capacity:** Maximum output of 3 ADC and maximum input voltage of 32 VDC.
- **3-Stage Charging:** Automatically determines battery connection, voltage, and charge level to manage the charging process.
- **Easy to Use:** Features a clear LED battery voltage and status indicator for easy monitoring.
- **Safety Features:** Protection against reverse connection, overvoltage, short circuit, and over temperature.
- **Compatibility:** Designed for use with 12-volt batteries.

### Components:



**Figure 1:** Top view of the Battery Tender Solar Panel Charge Controller. Note the clearly labeled "INPUT" terminals for the solar panel and "OUTPUT" terminals for the battery, along with the "CHARGING / CHARGED" LED indicator.



**Figure 2:** Angled view of the controller, highlighting its compact design and screw terminals for secure wire connections.



**Figure 3:** A different angled perspective of the controller, showing the overall form factor and mounting holes.

- **Input Terminals:** Labeled "INPUT" with '+' and '-' for connecting the solar panel.
- **Output Terminals:** Labeled "OUTPUT" with '+' and '-' for connecting to the battery.
- **LED Indicator:** Displays charging status ("CHARGING" or "CHARGED").
- **Mounting Holes:** For securing the controller in a suitable location.

## SETUP

Follow these steps to set up your Battery Tender Solar Panel Charge Controller:

1. **Prepare Wires:** Ensure all wires are appropriately sized for your solar panel and battery, and have clean, secure connections (e.g., spade terminals).
2. **Connect to Battery:** Connect the positive (+) wire from your 12-volt battery to the "OUTPUT +" terminal on the controller. Then, connect the negative (-) wire from your battery to the "OUTPUT -" terminal.
3. **Connect to Solar Panel:** Connect the positive (+) wire from your solar panel (rated 5W-45W) to the "INPUT +" terminal on the controller. Then, connect the negative (-) wire from your solar panel to the "INPUT -" terminal.
4. **Secure Connections:** Ensure all screw terminals are tightened securely to prevent loose connections and potential arcing.
5. **Mount Controller:** Mount the controller in a dry, well-ventilated area, away from direct sunlight and moisture,

using the provided mounting holes.

Once connected, the LED indicator will show the charging status.

## OPERATING INSTRUCTIONS

The Battery Tender Solar Panel Charge Controller operates automatically once properly connected. It utilizes a 3-stage charging process to ensure optimal battery charging and maintenance:

- **Bulk Charge:** When the battery voltage is low, the controller delivers maximum current to rapidly bring the battery to approximately 80% charge. The LED indicator will typically show "CHARGING" during this phase.
- **Absorption Charge:** As the battery approaches full charge, the voltage is held constant, and the current gradually decreases. This stage ensures the battery is fully charged without overcharging. The LED indicator will remain "CHARGING".
- **Float Charge:** Once the battery is fully charged, the controller reduces the voltage to a lower "float" level, maintaining the battery at full charge and compensating for self-discharge. The LED indicator will show "CHARGED".

### LED Indicator Status:

LED Status	Meaning
"CHARGING" (Green)	The battery is currently being charged.
"CHARGED" (Green)	The battery is fully charged and is being maintained in float mode.
No Light	No solar input, battery not connected, or an error condition. Refer to Troubleshooting.

## MAINTENANCE

Regular maintenance helps ensure the longevity and optimal performance of your solar charge controller:

- **Inspect Connections:** Periodically check all wire connections to ensure they are clean, tight, and free from corrosion.
- **Clean Controller:** Wipe the exterior of the controller with a dry, soft cloth to remove dust and dirt. Do not use liquid cleaners.
- **Environmental Protection:** Ensure the controller remains protected from direct exposure to rain, snow, and excessive humidity.
- **Battery Health:** Regularly check your battery's fluid levels (if applicable) and terminal condition as per the battery manufacturer's recommendations.

## TROUBLESHOOTING

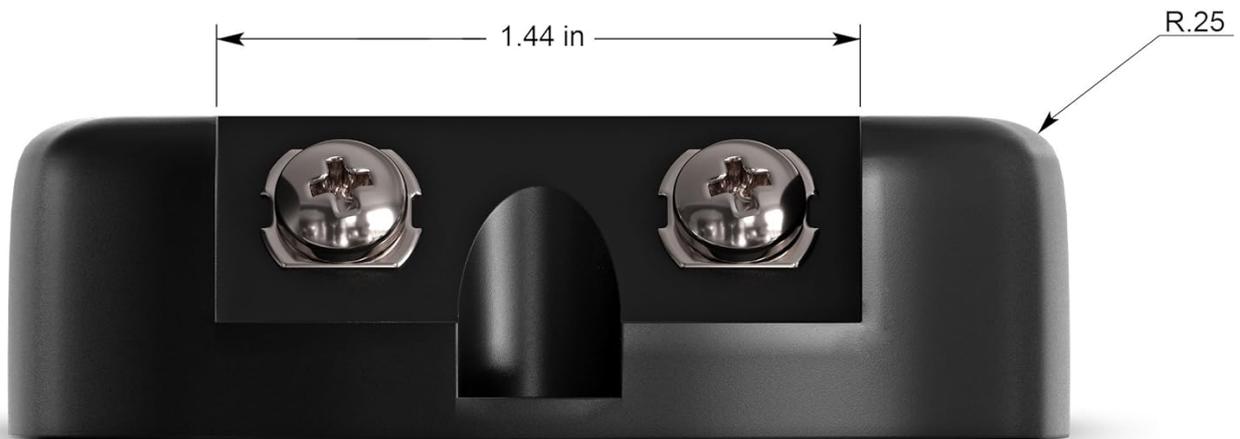
If your Battery Tender Solar Panel Charge Controller is not functioning as expected, refer to the following common

issues and solutions:

Problem	Possible Cause	Solution
LED indicator is off.	No solar input (e.g., night, cloudy, panel covered), battery not connected, or incorrect polarity.	Ensure solar panel is exposed to adequate sunlight. Check all connections for proper polarity and secure contact. Verify battery is connected.
Battery not charging or charging slowly.	Insufficient sunlight, undersized solar panel, faulty connections, or a deeply discharged/damaged battery.	Ensure solar panel is clean and optimally positioned. Verify solar panel wattage is within 5W-45W. Check all wiring for loose or corroded connections. Test battery condition.
Controller feels hot.	Overload, short circuit, or poor ventilation.	Ensure proper ventilation around the unit. Check for short circuits in wiring. Verify solar panel and battery are within specified limits. The controller has over-temperature protection.
LED indicates error (if applicable, though this model has simple CHARGING/CHARGED).	Reverse polarity, overvoltage, or short circuit detected.	Immediately disconnect all power. Recheck all connections for correct polarity. Verify solar panel voltage is below 32 VDC. Inspect wiring for any short circuits. Reconnect carefully.

If problems persist after following these steps, please contact Battery Tender customer support.

## SPECIFICATIONS



**Figure 4:** Side view of the controller, illustrating its compact dimensions for installation.

Specification	Value
Model Number	021-1162
Compatible Battery Voltage	12 Volts
Max Solar Panel Wattage	45 Watts
Max Input Voltage	32 VDC

Specification	Value
Max Output Current	3 ADC
Charging Stages	3-Stage (Bulk, Absorption, Float)
Display Type	LED
Product Dimensions (L x W x H)	3.8" x 0.75" x 2.45"
Item Weight	0.01 Ounces
Material	Carbon Steel
UPC	000038070099, 734357116205

## WARRANTY AND SUPPORT

Battery Tender products are manufactured by Deltran USA, a family-owned company with over 50 years of experience in automotive, powersport, and marine products. While specific warranty details are not provided in this manual, Battery Tender is committed to quality and customer satisfaction.

For warranty information, technical support, or assistance with your Battery Tender Solar Panel Charge Controller, please visit the official Battery Tender website or contact their customer service department directly. Contact details can typically be found on the product packaging or the manufacturer's website.

## ADDITIONAL RESOURCES

For more information about Battery Tender products and their commitment to quality, you may view the official brand video below:

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**Video:** "Battery Tender - Start with Trust". This video provides an overview of the Battery Tender brand and its product philosophy. It showcases various Battery Tender products and their applications, emphasizing reliability and ease of use.