

**MANUAL****Model: EQ 12/24-20**

Solar Converters Inc. - Rev. E

**IMPORTANT NOTE:** Unit is bi-directional in its operation. Please take a moment to ensure the input and output voltage required and the direction of the power flow. Misconnection or backwards connection of the unit may provide either half the voltage or twice the voltage to the load, with potential damage to the load and/or unit.

**Warning:** This unit may operate from multiple **hazardous** energy sources. Ensure that all power sources are inactive before making any connections to this unit. Ensure proper procedures and the appropriate electrical codes are followed. To be serviced only by qualified personnel.

**Warning:** Ensure the battery is disconnected and/or safe operating procedures are followed when making battery connections. Extreme care must be taken to ensure the battery is not shorted. Make sure all strands are inside their respective terminals. Qualified personnel only to connect and service this unit.

**START HERE****Section 1:**

Please determine if a step down, step up or battery equalization function is required.

- If the load voltage is 1/2 the input voltage = step down. Go to Section 2
- If the load voltage is twice the input voltage = step up. Go to Section 3
- If used to equalize battery voltage to account for battery voltage mismatch, used as both step up and step down. Go to Section 4.

**Section 2: Step Down Transformer**

Input Voltage: 10.5 - 32 DC volts

Current: 0 - 10 amps nominal

Output Voltage: 5.5 - 16 DC volts = 1/2 input voltage

Current: 0 - 20 amps continuous

**2.1 Common Connection**

Using wire of sufficient amperage for the load connection (#12 AWG or better) connect the negative of the battery to the BLACK #12 AWG flying lead and the negative connection of the load.

**2.2 Load Power Connection**

Using a wire of sufficient amperage for the load power (#12 AWG or better) connect the positive of the load to the WHITE #12 AWG flying lead.

**2.3 Input Power Connection**

Using wire of sufficient amperage for the input connection (#12 AWG or better) connect the positive of the battery to the RED #12 AWG flying lead.

**Section 3: Step Up Transformer**

Input Voltage: 10.5 - 16 DC volts

Current: 0 - 20 amps nominal

Output Voltage: 21 - 32 DC volts = twice input voltage

Current: 0 - 10 amps continuous

### 3.1 Common Connection

Using wire of sufficient amperage for the load connection (#12 AWG or better) connect the negative of the battery to the BLACK #12 AWG flying lead and the negative connection of the load.

### 3.2 Load Power Connection

Using a wire of sufficient amperage for the load power (#12 AWG or better) connect the positive of the load to the RED #12 AWG flying lead.

### 3.3 Input Power Connection

Using wire of sufficient amperage for the input connection (#12 AWG or better) connect the positive of the battery to the WHITE #12 AWG flying lead.

## **Section 4: Step Up and Step Down Transformer or Battery Voltage Equalization**

Input/Output Voltage High: 12 - 32 DC volts

Current: 0 - 10 amps nominal

**This is the voltage off the top of your battery string nominally 24 V**

Input/Output Voltage Low: 6 - 16 DC volts

Current: 0 - 20 amps continuous

**This is the midpoint voltage off your battery string nominally 12 V**

Unit uses its bi-directional capability to take power from the higher voltage battery and transfer the excess charge to the lower voltage battery. The net effect is to bring the battery voltages to be exactly equal. As well, as load current is taken off the battery, the stronger battery will support the weaker battery, making your battery power last longer.

### 4.1 Common Connection

Using wire of sufficient amperage for the load connection (#12 AWG or better) connect the negative of the battery string to the BLACK #12 AWG flying lead. **Nominally this is the negative connection of the 24 V battery.**

### 4.2 Low Voltage Connection

Using a wire of sufficient amperage for the load power (#12 AWG or better) connect the midpoint of the battery set to the WHITE #12 AWG flying lead. **Nominally this is the 12 V point in your 24 V battery string.**

### 4.3 High Voltage Connection

Using wire of sufficient amperage for the input connection (#12 AWG or better) connect the positive of the battery to the RED #12 AWG. **Nominally this is the 24 V positive connection of the 24 V battery.**

Note: It may take a while for the unit to equalize the voltages of the batteries as a considerable amount of charge movement between batteries may be required depending upon the state of charge and quality of the respective batteries.

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## WARRANTY

The product is warranted to be free from defects in material and workmanship for a period of one (1) year from the date of purchase by a retail customer. The purchase date must be evidenced by a valid and original sales receipt. In lieu of sales receipt, factory will use code date on its label. Removal of the Solar Converters Inc. label or serial number will void the warranty.

Product liability, except where mandated by law, is limited to repair or replacement at the manufacturer's discretion. No specific claim of merchantability or use shall be assumed or implied beyond what is printed on the manufacturers printed literature. No liability shall exist from circumstances arising from the inability to use the product, or its inappropriateness for any specific purpose or actual use, or consequences thereof for any purpose. **It is the user's responsibility to determine the suitability of the product for any particular use.** Solar Converters Inc. shall not be liable for any damages or any kind including without limitation, special, incidental or consequential obligations and liabilities of Solar Converters Inc. and the remedies of Buyer set forth herein shall be Solar Converters Inc. sole and exclusive liability.

Failure to provide a safe and correct installation, safe operation, or care for the product will void the warranty. Personal safety, and compatibility with any other equipment is the ultimate responsibility of the end user. Any returned product that shows significant evidence of abuse may not be covered by this warranty. Installation must be performed by a person with qualification to insure safe and effective operation and the installation thereof certifies that the installer has the technical qualifications to do so.

Solar Converters Inc. cannot guarantee the compatibility of its products with other components used in conjunction with Solar Converters Inc. products, including, but not limited to, solar modules, batteries, and system interconnects, and such loads as inverters, transmitters and other loads which produce "noise" or electromagnetic interference, in excess of the levels to which Solar Converters Inc. products are compatible. Solar Converters Inc. shall not assume responsibility for any damages to any system components used in conjunction with Solar Converters Inc. products nor for claims for personal injury or property damage resulting from the use of Solar Converters Inc. products or the improper operation thereof or consequential damages arising from the products or use of the products.

The warranties set forth herein are Solar Converters Inc. sole and exclusive warranties for or relating to the goods. Seller neither makes nor assumes any warranty or merchantability, any warranty fitness for any particular purpose, or any other warranty of any kind, express, implied or statutory. Solar Converters Inc. neither assumes nor authorizes any person or entity to assume for it any other liability or obligation in connection with the sale or use of the goods, and there are no oral agreements or warranties collateral to or affecting the sale of the goods.

### WARRANTY CLAIM PROCEDURE

In the event of product failure, follow this warranty claim procedure.

1. Make sure the problem you are having is actually due to the suspected product and not some other part of the system. You may call technical support for advanced troubleshooting assistance.
2. If you determine that a Solar Converters Inc. product is actually defective, describe on paper, in detail the exact nature of the failure.
3. The product must be accompanied by proof of the date of purchase satisfactory to Solar Converters Inc.
4. Return the product and description to the business office address, along with your address and a daytime phone number. Purchasers must prepay all delivery costs or shipping charges as well as any other charges encountered, in shipping any defective Solar Converters Inc. product under this warranty policy. **No shipment will be accepted Freight Collect.**
5. Any return shipment from Solar Converters Inc. will be via Canada Post. Foreign shipments will ship best way. Special shipping arrangements are available at the customer's expense.