

**MANUAL****Model: PT 12/24-15**

Solar Converters Inc. - Rev. G

**1.0 Specification**

**Note: This unit is a dual voltage unit, both 12 and 24 V input and output, with a mixed 24 V input 12 V output option.**

Connection: Power: max. AWG # 10 Eurostyle terminal strip  
Signal: max. AWG # 14 Eurostyle terminal strip

Maximum power point tracking to optimize output power. Delivers 15 - 20 % more real charging current, nominally >30%.

Charge Technique: Dual float. Unit charges to float voltage + 0.3V (0.6 V @ 24 Stetting), then drops to float voltage when charge current drops under 10 %.

No User load overvoltage regulates output voltage to "float" voltage even with no battery connected.

Temperature range: -40C to +60C

Open frame construction - panel mounted for standard NEMA boxes NEMA boxes for unit available from Solar Converters Inc.

Efficiency: >94% over 20% charging load,

No need for external blocking diode,

Battery fused: MDL -20

Transient protected - input and output

**1.1 Set up as a 12 V unit, no jumpers in place**

Input Voltage: 0 - 45 DC volts PV Array, approx. 16 V nominal operating  
Current: 0 - 15 DC amps nominal,

Output Voltage: 10 - 15 V DC, factory set 14.1 V  
Current: 15 amps continuous, (provided sufficient solar power),

Integral LVD: off at 11.0 V +/- 0.1, on at 11.5 V

**1.2 Set up as a 24 V unit: Both PV and BAT jumpers in place**

Input Voltage: 0 - 45 DC volts PV Array, approx. 32 V nominal operating  
Current: 0 - 15 DC amps nominal,

Output Voltage: 20 - 30 V DC, factory set 28.21 V  
Current: 15 amps continuous, (provided sufficient solar power),

Integral LVD: off at 22.0 V +/- 0.1, on at 23 V

**1.3 Set up as a 24 input, 12 V output unit, PV jumper in place only**

Input Voltage: 0 - 45 DC volts PV Array, approx. 32 V nominal operating  
Current: 0 - 15 DC amps nominal,

Output Voltage: 10 - 15 V DC, factory set 14.1 V

Current: 15 amps continuous, (provided sufficient solar power),

Integral LVD: off at 11.0 V +/- 0.1, on at 11.5 V

#### 1.4 Motor Driver

Specification identical to above with the following additions. The motor/pump connects to the "battery terminals for direct drive, and the load terminals for battery-backed systems. While it does not require a battery, this unit can have a battery connected to it, charge control the battery and also turn the motor/pump on and off using the LVD terminals connected to a float switch or electronic timer.

**Warning:** On this revision it is strongly recommended that an in-line fuse or thermal cut-off be added to the pump connections. The Power Tracker(TM) performs a true power transformation (Voltage X Current). If there is no back voltage from the motor the Power Tracker(TM) is quite capable of putting in excess of 3 X its rating short term into the motor during jammed or stalled conditions from as little as 1 solar panel.

Start Current: 40 Amps for 1 minute

Run Voltage: (12 V settings for PV and BAT)

Adjustable 10 - 15 V DC factory set to 14.1 V

(24 V settings for PV and BAT)

Adjustable 20 - 30 V DC factory set to 28.1 V

Does not require a battery connected

#### 2.0 Power Connections

**Warning:** Before connecting power cable to this unit, evaluate the PV and battery voltage and set the units voltage select jumpers accordingly. See signal connections for proper wiring of voltage select termination.

**Warning:** This unit operates 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 and operated only by qualified personnel.

##### 2.1 Ground

Using wire of sufficient amperage (min. #10 AWG) connect the ground post of unit to appropriate system ground as required by the appropriate electrical code. Note this ground is not internally connected to the unit negative terminals.

##### 2.2 Input Power Connection

Input voltage: 0 - 45 V DC CHECK VOLTAGE SETUP OF INPUT VOLTAGE

Input current: 12 A DC max. nominal

Using a wire of sufficient amperage for the input power (min. #14 AWG) connect the positive of the solar panel (through the strain relief clamp) to the PV + terminal of the solar regulator. Connect the negative of the solar panel to the PV - terminal of the solar regulator.

##### 2.3 Load Connection

Output voltage: 11 - 30 V DC CHECK VOLTAGE SETUP OF OUTPUT VOLTAGE

Output current: 0 - 15 amps nominal for specified regulation,

(Total load = load current + battery current)

Using wire of sufficient amperage for the load connection #14 AWG or better connect the positive of the load (through the strain relief) to the positive load connection of the solar regulator terminal block. Similarly connect the negative of the load to the negative load connection of the solar regulator.

## 2.4 Battery Connection

Output voltage: 11- 30 V DC CHECK VOLTAGE SETUP OF OUTPUT VOLTAGE

Output current: 0 - 15 amps nominal,  
(Total load = load current + battery current)

**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. BE SAFE. Make sure all strands are inside their respective terminals. The battery must be fused. Qualified personnel only to connect and operate this unit.

Using wire of sufficient amperage for the load connection #14 AWG or better (preferred for regulation) connect the positive of the battery (through the strain relief) to the positive battery connection of the solar regulator terminal block. Similarly connect the negative of the battery to the negative battery connection of the solar regulator terminal block.

## 3.0 Signal Connection

### 3.1 Remote Shutdown

**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.

This unit can drive a secondary LVD relay with the RS connection. This provision is for higher voltage units where a secondary LVD may be required to obtain the full Load rated current.

The unit applies 12 V @ 0.1 A to the RS terminals to power a relay connected such as to disconnect the load when the relay is powered.

### 3.2 Temperature Compensation

This regulator is designed to use the voltage of a temperature sensitive zener (National Semiconductor # LM335Z or equiv.) attached at the battery location (hence battery temperature). This unit is available from Solar Converters Inc. as Model No. TC-2.

**Warning:** If temperature compensation is not used, a 3k precision resistor must be connected between the TC+ and TC- terminals (its default condition). Lack of this resistor will not harm the regulator, but will require re-adjustment of the output voltage.

If temperature compensation is being used, remove the 3k resistor across terminals TC+ and TC-. Using a wire of sufficient amperage (#24 AWG or better) connect the TC+ terminal to the anode (the red lead) of the temperature sensitive zener. Similarly connect the TC- terminal to the cathode (the black lead) of the temperature sensitive zener (LM335Z).

**Warning:** This connection is not line isolated. Do not expose to any voltage not reference to the low voltage ground of the regulator.

Note: Shielded twisted pair is recommended if the batteries are a "substantial" distance from the regulator.

### 3.3 Load Disconnect

The load may be remotely disconnected by shorting the LVD pins together with a suitable switch device. Devices like float switches or electronic timers for load control can do this.

Electrical ratings:

12 V DC 0.1 A DC

### 3.4 Voltage Select

The control Voltage of the unit is selected by shorting across the PV and BAT terminals for 24 V operation or leaving open for 12 V operation respectively.

Note: This unit is capable of charging a 12 V battery bank from 24 V panels while putting maximum power into the battery.

Using small signal wire Min. #28 AWG, short the respective PV or battery terminals for 24 V operation. Leave the terminals open for 12 V operation.

### 4.0 Regulator Control Function

LEDs in the status section signal the status of the unit at any time. The status is also remotely signaled by the remote functions of the same name.

4.1 On LED signals when the battery power is being applied to the load

4.2 1/3, 2/3, 3/3 LED's give an indication of the battery state of charge

4.3 Chrg The unit is "power tracking" maximum current into the battery

### 4.4 Float Setting

The "Float" voltage setting sets the regulation voltage of the regulator. The regulator will charge the battery at a voltage of the float voltage +0.3 V while the battery current is above 10% charging current and the regulator will hold the battery at the float setting while the battery charge current is less than 10% of charging current.

With a meter on the output voltage, adjust the Float set adjustment to the desired output voltage. The default setting of this adjustment is 14.1 Volts.

Note on 24 V settings the above numbers are doubled. The default setting is 28.2 V

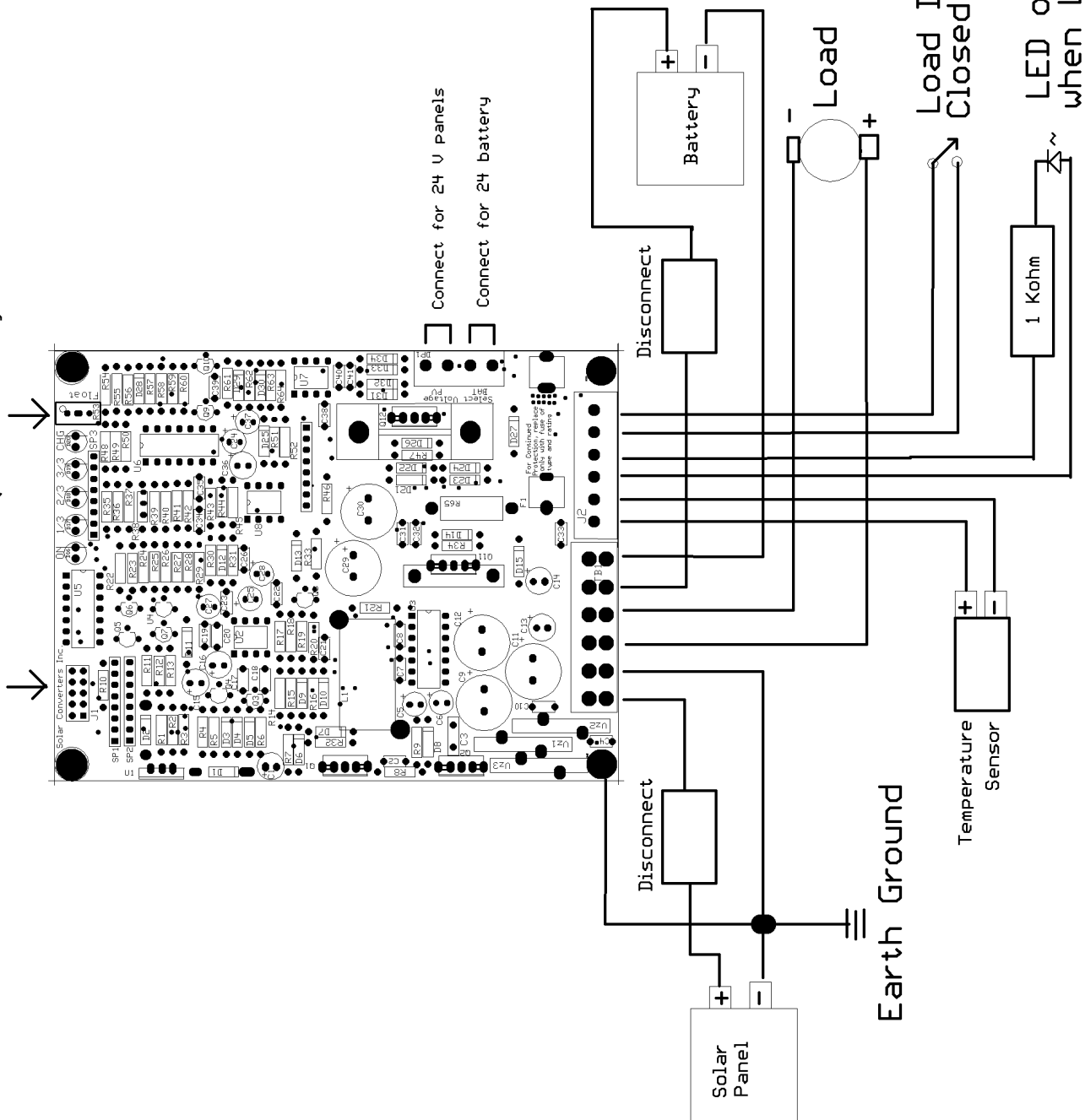
### 5.0 Meter

A meter option is available. This meter is a 3.5 digit LCD meter that turns itself off to limit long term battery drain.

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Model: PT 12/24-15  
REV G

Meter connects here      Adjust float voltage



Note: Load may be taken directly off battery terminal

**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 preformed 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.