

**MANUAL**  
**Model: VCS-1AL**  
**Voltage Controlled Switch, 30 amp Active Low**  
 Solar Converters Inc. - Rev. C

Solar Converter Inc. "Voltage Controlled Switch" is a power relay which has user adjustable voltage setpoints. Normally the relay is not powered, connecting the common terminal to the normally closed (NC) terminal.

This unit monitors the incoming voltage and if it goes under the "low" setpoint for 3 seconds, the power relay will switch on, connecting the common terminal (C) to the normally open (NO) terminal. Once the relay is on, the unit monitors the incoming voltage and if it goes above the high voltage setpoint for 3 seconds, the unit will turn off the power relay, connecting the common (C) terminal to the normally closed (NC).

**Warning:** To be serviced and operated by qualified personnel only. This unit operates from 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.

**Quick Setup**

While it is recommended that this manual be read in detail, for the experienced installer, this section describes a quick setup.

- 1) Connect the ground to the ground terminal of the terminal block, the one on the left of the little connector - see board marking.
- 2) Connect the power source to the V + terminal - the second on from the left of the little connector - see board marking.
- 3) With a voltmeter connected to the GND testpoint and the low setpoint, set the pot to be the low relay turn on voltage. Note there is a 1/10th scale factor. For example, to turn the relay on at 40.5 volts, set the pot to read 4.05 V.
- 4) Repeat with the high setpoint to set the low voltage turn off the relay.
- 5) Connect the power to be switch to the COM of the terminal block.
- 6) Connect the load connection to the NO or NC connection depending if you want the load to be powered or unpowered on relay action.

**Electrical Specifications**

Nominal Voltage (V)	12	18	24	36	48
Maximum Voltage	63 V				
Minimum Voltage	10 V				
Max. Output (A)	30	30	30	15	3

Basically rating of 30 amp relay  
 Potter and Brumfield T90 series

**IMPORTANT:** If the relay is to be used to for over 48 VAC or 63 V DC service, remove the 2 blue varistors under the black relay. These are used for ARC quench in the DC uses of the relay and are not needed for AC operation of the relay. Once removed, the unit can safely and properly switch 115 V AC service.

Self Consumption

Quiescent (ma)	17	17	17	17	17
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Relay on (ma)	75	57	47	37	32
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Delay on action 3 seconds

Default relay position on start-up between voltage setpoint - Relay On

### **User Controls**

The unit has 2 adjustment pots for high and low setpoints.

The setpoints have a 1/10 scale factor. To set a setpoint to trip at 12 V for example, set the setpoint to 1.2 V. To set it to trip at 48.5 V, set the setpoint to 4.85 V.

1) Power the unit with any source 10 V to 60 V connected to its V+ and ground of the terminal blocks.

2) With a voltmeter connected to the test point ground and the low setpoint, adjust the low setpoint pot such that the voltmeter reads 1/10th the voltage that the relay is to turn on at.

3) With a voltmeter connected to the test point ground and the high setpoint, adjust the high setpoint pot such that the voltmeter reads 1/10th the voltage that the relay is to turn off at.

### **Connections**

1) Ground:

Using wire of sufficient gauge (min. #20) connect the ground of the unit to the power ground of the voltage source. This wire only carries the power to operate the unit.

2) Power:

Using wire of sufficient gauge (min. #20) for the current to be carried per the appropriate electrical code, connect the positive of the voltage source to the V+ terminal.

3) WARNING: SETUP THE UNITS SETPOINT BEFORE CONNECTING THE LOAD to avoid unexpected operation from affecting your load.

4) Switched Power:

Using wire of sufficient gauge (min. #14) for the current to be carried per the appropriate electrical code, connect the power source to be switched to the COM connection of the terminal block.

5) Load:

Using wire of sufficient gauge (min. #14) for the current to be carried per the appropriate electrical code connect the positive of the voltage source to the NO or NC terminal depending upon whether you require the load to be connected or disconnected on relay action.

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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.