

## Solar panel array check

- **Open circuit solar panel array voltage check...** (with the system all connected correctly)  
Go to menu screen DATA/SOLV and check the reading (Note: charging will be stopped).  
Typical open circuit solar panel voltages in full sun for a 12V system is  $20V \pm 2V$   
( $40V \pm 4V$  for a 24V system,  $80V \pm 8V$  for a 48V system).  
A low voltage reading on the SOLV screen indicates panel(s) not connected (eg. breaker open), panel(s) in shade, physically damaged panel(s) or damaged associated wiring/connections.

- **Short circuit current test on the solar panel array...**  
*EQUIPMENT REQUIRED: Quality current meter capable of measuring the maximum short current of your solar panel array. A typical multimeter often has a 10Amp or 20Amp DC current range. If the maximum short circuit current of your array is greater than this you will have to test sections of the solar panel array separately, or you could short a large array with a spare shunt, and measure the mV across the shunt (eg. a 75mV 200A shunt will give 0.375 mV for each amp that is flowing).*

*HINT: A useful addition to your tool kit may be a current clamp meter (a current meter that measures current in a wire without an electrical connection). Some can measure up to 200A. These meters can be purchased from a local electronics store like Jaycar or Dick Smith.*

Typical short circuit current with panel in full sun for an 80W panel is approx 5A  
(130W panel approx 8A).

**This test should check the solar panel(s) and the associated wiring, so it's best to connect the current meter (multimeter) at the end of the solar panel wires closest to the regulator.**

If maximum short circuit current from solar array is able to be measured directly by your meter:

- Switch the multimeter to the highest DC current range (10A or 20A) and make sure that the multimeter leads are plugged into the correct sockets (COM/0V = Black, and 10Amp/20Amp = Red).
- Remove the SOL- wire from the regulator and connect the current meter COM /0V (black/negative) multimeter lead to this wire (solar negative wire).  
Connect the current meter 10A/20A (red/positive) multimeter lead to the positive solar array wire (no need to disconnect the positive solar array wire from the system).
- With the panels in full sun, check that the short circuit current is what you would expect.  
*Example:*
  - A 12V system that has 3 x **12V/80W** panels connected in parallel (3 panels total) should give a reading of up to 15Amps (3 x 5Amps).
  - A 24V system that has 6 x pairs of **12V/80W** panels connected in series/parallel (12 panels total) would give a reading of up to 30Amps as each series connected pair of **12V/80W** panels gives 5Amps **at 24V**. This equates to approximately 30Amps total short circuit current from the solar array (6 x 5Amps).

**NOTE: If you are using a standard multimeter with a 20Amp maximum current range you will have to split this array up in order to measure the short circuit current as 30Amps is a lot higher than the 20Amp multimeter maximum. Try to measure at the regulator wiring end for one test so you are checking the wiring as well.**

A lower than expected short circuit current reading could be the result of: shaded panel(s) (not all in full sun), physically damaged panel(s), damaged/corroded panel connections, or damaged/corroded wiring or associated connections.