



T80HV TURBOCHARGER™



**Wire the PV modules in series up to
200 Voc max 160 volts nominal**

**80 Amps continuous output at up to
45°C / 113°F ambient temperature**

Free Battery Energy Monitor Built In

**Wired Remote Display / Internet
Monitoring**

**One-minute set-up with fail-safe
calculated defaults**

**Patent Pending MPPT Provides
Best Energy Harvest Available**

**Easy stacking of up to 16 T80HV's
in parallel for higher currents**

**Precision charging of 12/24/36/48V
batteries using voltage sense wires**

HIGH VOLTAGE INPUT, 80 AMP MPPT BATTERY CHARGE MANAGEMENT SYSTEM

200 Volt maximum PV open circuit voltage

The T80HV is the only MPPT charge controller that works with the newer higher voltage PV modules. Specifically, the Sanyo HIT 200 modules have V_{mp} of 51.75v at 50°C which will not charge a 48 volt battery, but they generate up to 79.88 volts open circuit at -40°C. Two of these modules in a series string will generate 103 volts at V_{mp} , but the V_{oc} is almost 160 volts which will destroy all the 140/150 volt charge controllers. The T80HV is designed to operate up to 200 V_{oc} and 160 V_{mp} and works with the Sanyo HITs.

FREE Energy Monitor Built In

The T80HV includes a built-in Energy Monitor using TriMetric™ Technology from Bogart Engineering. The monitor tracks power production and consumption to calculate the energy remaining in the battery. State-of-Charge (SOC) is displayed in Percent Full, Amp-hours, Watt-Hours, and Bar-Graph format. In addition, 90 days of energy-harvest history is stored in the T80HV.

Power and Control in a Single Device

The T80HV *TurboCharger™* integrates Maximum Power Point Tracking, battery charge management, state-of-charge information, and communications into a single device.

Integral Performance-and-Update Communications

The slot for optional add-in cards provides data communication to Wireless Remote Displays, PCs and the Internet. System performance can be monitored remotely and the T80HV accepts software upgrades using a PC and the Remote Display SD Card.

Continuous Power Rating Up to 45°C/113°F Ambient

The T80HV *TurboCharger™* produces full-rated power without de-rating at up to 45°C ambient temperature. Above that temperature, the output current is reduced gradually to protect the life of the T80HV and then automatically ramped up as the temperature decreases. High-efficiency power circuits and robust thermal design minimize heat generation. The internal temperature-controlled variable speed fan runs just fast enough to maintain optimum reliability.

Optimum MPPT/Charging Efficiency Cuts Costs

The T80HV captures up to 35% more power from the photovoltaic (PV) array with patent-pending MPPT technology. The Apollo MPPT algorithm starts early and locks onto the peak power during rapidly changing insolation and temperature. The T80HV dramatically cuts the cost of a PV system by reducing the number of PV panels required, eliminating the need for heavy gauge wiring, and increasing the life of the storage batteries.

Enhanced Battery Performance and Life

The T80 supports Flooded Lead Acid (FLA), GEL and Absorbed Glass Mat (AGM) batteries. Four-stage charging with adjustable set points for all parameters.

T80HV TurboCharger™ SPECIFICATIONS

Maximum output current	80 Amps continuous at up to 45°C/113°F ambient temperature
Battery voltages	12, 24, 36, or 48 VDC nominal
Max PV input current	70 Amps
Input voltage range	16 to 160 VDC operating 200VDC Maximum Open Circuit Voltage
Max PV array power	5200W for 48v batteries, 2600W for 24v batteries, 1300W for 12v batteries
Charge regulation modes	Bulk, Absorption, Float, Standby, Auto Equalization, and Manual Equalization
MPPT Features	Apollo Solar patent-pending MPPT algorithm harvests the optimum power under all conditions of clouds or temperature.
Battery temperature compensation...	6.0mV per °C per 2 volt cell
DC to DC conversion capability	Charge 48v batteries from 68 to 160* volt PV arrays Charge 36v batteries from 51 to 160* volt PV arrays Charge 24v batteries from 34 to 160* volt PV arrays Charge 12v batteries from 17 to 80 volt PV arrays – not recommended to charge 12v batteries from over 80 volts of PV for efficiency reasons. *Check max Voc from PV modules at low temperature extremes.
Display	Built-in 4-line 20-character LCD with back light
Status reporting	LCD status screen displays Input voltage and current, Output voltage and current, Charge-mode, and Battery State-Of-Charge (SOC).
Data logging	Logs energy harvested for 90 days. LCD displays Watt-hours, kW-hours, Amp hours, and hours each day that Float mode is active.
Energy Monitor	LCD shows SOC (State-of-Charge) in a fuel gauge style bar graph as well as % Full, Amp-hours, Watt-hrs and present charge or discharge current. A 50mV/500Amp shunt is required to use the Energy Monitor features.
Auxiliary relays	Two independent relays with form A (SPST) contacts for control of external devices. Configurable as NO or NC. Contact rating ½ Amp, 50 VDC.
Operating Temperature	Full power output to +45°C ambient Output current automatically ramped and de-rating down above 45°C and softly restored as temperature decreases.
Standby Power	Less than 2 Watts
Data Communication Options	Card slot for optional Apollo Network and Wireless link to Remote Display.
Connectors	Power lugs accept 14 to 1/0. No. 2 wire recommended.
Conduit knockouts	One 1" or 1-¼" and one ½" or ¾" on left side. Two ½" or ¾" on back. Two 1" or 1-¼" on bottom. Bottom holes line up with power connectors.
Unit dimensions	38.7cm X 21.6cm X 11.1cm (15.2" X 8.5" X 4.4") Length X Width X Depth
Shipping dimensions	53cm X 31.8cm X 21.6cm (21" X 12 ½" X 8 ½")
Weight	Unit: 7.3 kg/16 lbs Shipping weight: 10 kg/22 lbs
Certification	UL1741, CSA C22.2 No. 107.1
Warranty	5-year Limited Warranty
Environmental rating	Ambient Temperature: -40°C to +60°C; Storage Temperature: -55°C to +100°C; Humidity: 100% non-condensing; Enclosure: Indoor Type 1
Included Accessory Kit	Apollo Shunt Board and cable, battery monitor cable, and Battery Temp Sensor
Optional Accessories	True Sine Wave Inverter / Chargers TSW3224, TSW4048 Inverter Switchgear Module (ISM) enclosure with DC and AC breakers & System Monitor



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Specifications are subject to change without notice. October 2009