

TRISTAR MPPT ™600V Solar · Wind · Hydro

HIGH VOLTAGE CHARGE CONTROLLER



Product shown with optional meter.

Morningstar's TriStar MPPT 600V Charge Controller can be used with higher voltage photovoltaic (PV) arrays, wind turbines or hydropower systems. This product enables the following application scenarios:

- Adding modules incrementally with no string sizing issues
- Off-grid PV, wind or hydro systems with input voltages greater than 150V
- Fewer combined circuits and lower current for long wire runs from the array to the controller
- New installation grid-tie PV systems with battery back-up
- Retrofitting grid-tie PV systems to include battery back-up without changing the PV array configuration
- Supplementary charging for AC Coupled PV systems

KEY FEATURES AND BENEFITS

High Voltage Capacity

- Maximum input voltage of 600V
- Operates with PV array Voc voltages up to 525 Voc
- Wind, hydro operating voltages up to 500 Vdc
- Pre-set for 48 Vdc battery systems
- Programmable for 24V, 36V and 60V battery systems
- Allows long wire runs from the array to the controller
- Higher voltage reduces voltage drop and wire costs
- No combiner boxes required for single or two string systems
- Better enables grid-tie PV systems with battery back-up
- Enables easier PV array expansion than lower voltage systems and accommodates increasing loads
- Supports battery based solar PV, wind, hydro and other high voltage DC power systems

■ Extremely High Reliability

- Robust thermal design and no cooling fans
- No moving parts
- Superior lightning protection from nearby lightninginduced voltage/current spikes
- Extensive electronic protections
- Epoxy encapsulated inductors and conformally coated printed circuit boards

Very High Efficiency

- 97.9 % peak efficiency
- Proprietary tracking algorithm minimizes power losses
- Low self-consumption
- Continuous operation at full power to 45°C ambient temperatures without need to de-rate
- Electronic devices with higher ratings to minimize losses from heating

Maximizes Energy Harvest

Our TrakStar™ MPPT Technology features:

- Better peak power point tracking than other MPPT charge controllers
- Very fast sweeping of the entire PV array
- Recognition of multiple power points during shading or mixed PV arrays
- Low input voltage operation
- Excellent performance at sunrise and low solar insolation levels

Communications Capabilities

- Enables system monitoring, data logging and adjustability. Uses open standard MODBUS™ protocol and Morningstar's MS View software
- Meterbus: Communications between compatible Morningstar products
- Serial RS-232 and EIA-485 serial connectivity
- Ethernet: fully web-enabled interface to a local network or internet; view from a web browser or send email

Other Features

- High-Low voltage barrier improves safety
- Available with optional Disconnect Box: 600V PV disconnect switch, battery breaker and prewired input/ output bus bars
- Parallel Operation up to four TS-MPPT-600V controllers in parallel to manage charging from a single solar, wind or hydro input up to 12.8kWp Nominal
- Available with DC Transfer Switch option for switching from a GT string inverter to battery backup charging during a utility outage.

TRISTAR MPPT™ 600V CHARGE CONTROLLER



Four Versions:

TS-MPPT-60-600V-48 Standard

TS-MPPT-60-600V-48-DB With Disconnect Box (600V; 25A 1-Pole disconnect switch)

TS-MPPT-60-600V-48-DB-TR* With DC Transfer Switch (600V; 30A double pole; double throw DC Transfer Switch)

TS-MPPT-60-600V-48-DB-TR-GFPD** Pre-wired with Ground Fault Protection Device

All non-standard versions include a 1-Pole; 63A PV battery breaker*** and pre-wired PV/Battery busbars TR versions also include a pre-wired String Inverter busbar

TECHNICAL SPECIFICATIONS

Electrical

 Peak Efficiency 97.9% Maximum Battery Current 60A

 Maximum Input Operating Current 15A (self limiting)

 Maximum Solar Open Circuit Voltage 600V

 Nominal Maximum Operating Power**** 3200Wp, 48 Volt

 Nominal System Voltage 48 Vdc

custom programmable to 24V, 36V and 60V

 Battery Operating Voltage Range 16-72 Vdc

 PV Input Operating Voltage Range 100V to Voc = 525V

Wind/Hydro Input Operating

Battery Voltage to 500V Voltage Range

1.75 - 2.50 W Self-Consumption

 Transient Surge Protection 4500 Watts/port

Electronic Protections

Overload, high voltage Input

Battery High voltage, battery sense disconnected,

remote temperature sense disconnected

 General Operation High temperature, reverse current at night, lightning and transient surges

Environmental

 Ambient Temperature -40 °C to +45 °C -55 °C to +85 °C Storage Temperature

 Humidity 100% non-condensing

 Tropicalization Epoxy encapsulation, conformal coating, marine-rated terminals

Battery Charging

 Charging Stages MPPT, absorption, float, equalize

• Temperature Compensation

 Coefficient -5mV/°C/cell (25° ref)

Range -30 °C to +80 °C / -22 °F to +176 °F Absorption, Float, Equalize, HVD Set points

Note: Remote Temperature Sensor is included.

Mechanical

Dimensions

39.2 x 22.1 x 14.9 cm / 15.4 x 8.7 x 5.9 in Standard Version 54.2 x 22.1 x 14.9 cm / 21.4 x 8.7 x 5.9 in DB & TR Version

Unit Weight

 Standard Version 9.0 kg / 19.8 lbs DB & TR Version 12.8 kg / 28.1 lbs

Maximum Wire Size

 Power Terminals 2.5 mm² - 35 mm² / 14 AWG - 2 AWG RTS/Sense Terminals 0.25 mm² - 1.0 mm² / 24 AWG - 16 AWG

 Conduit Knockouts M20; 0.50, 1.00, 1.25 inches

 Enclosure Rating Type 1 (indoor and vented), IP20

Communication

Ports Ethernet, EIA-485, RS-232, MeterBus

 Supported Protocols MeterBus, MODBUS RTU, MODBUS TCP/ IP, HTTP, SNMP v2, SMTP

Certifications

CE, RoHS, NEC Compliant

ETL Listed: UL-1741 and Canadian CSA C22.2 No. 107.1.01

FCC Class B Part 15 Compliant

Options

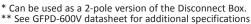
TriStar 600V Meter (TS-M-2-600V)

TriStar Remote Meter (TS-RM-2)

Meter Hub (HUB-1)

Relay Driver (RD-1)

600V Ground Fault Protection Device (GFPD-600V)



*** Can be replaced with 2-pole battery breaker.

**** Input power can exceed Nominal Maximum Operating Power, but controller will limit and provide its rated continuous maximum output current into batteries. This will not harm the controller.

WARRANTY: Five year warranty period. Contact Morningstar or your authorized distributor for complete terms.

















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