MORNINGSTAR
World's Leading Solar Controllers & Inverters

TriStar MPPT™ 600V

Solar • Wind • Hydro

Product shown with optional meter.

HIGH VOLTAGE CHARGE CONTROLLER WITH MAXIMUM POWER POINT TRACKING

Morningstar's TriStar MPPT 600V Charge Controller offers a highly efficient power path for charging batteries with higher voltage photovoltaic (PV) arrays, wind turbines or hydropower systems. The controller's higher voltage capability and flexible design enable several application scenarios including:

- 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 to accommodate 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
- Conformally coated printed circuit boards
- No moving parts
- Superior lightning protection from nearby lightning-induced 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
- Selected 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

Extensive Networking and 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: connection to a personal computer
- EIA-485: communications between multiple devices on a bus
- 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 (internal barriers between the high voltage PV and low voltage battery wiring)
- 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 12.5kWp

TRISTAR MPPT™ 600V CHARGE CONTROLLER

TRAKSTAR™ MAXIMUM POWER POINT TRACKING

Versions:

Standard	TS-MPPT-60-600V-48
With Disconnect Box	TS-MPPT-60-600V-48-DB

Includes:
- 600V PV disconnect switch
- battery disconnect breaker
- pre-wired input/output busbars

TECHNICAL SPECIFICATIONS

Electrical

Peak Efficiency	97.9%
Maximum Battery Current	60A
Maximum Input Operating Current	15A
Maximum Solar Open Circuit Voltage	600V
Nominal Maximum Solar Input	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 Voltage Range	Battery Voltage to 500V
Self-Consumption	1.75 - 2.50 W
Transient Surge Protection	4500 Watts/port

Electronic Protections

Input	Overload, high voltage
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
Storage Temperature	-55 °C to +85 °C
Humidity	100% non-condensing
Tropicalization	Epoxy encapsulation, conformal coating, marine-rated terminals

Battery Charging

Charging Algorithm	4-Stage
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
Set points	Absorption, Float, Equalize, HVD

Note: Remote Temperature Sensor is included.

Mechanical

Dimensions	
Standard Version	39.2 x 22.1 x 14.9 cm / 15.4 x 8.7 x 5.9 in
With Disconnect Box	54.2 x 22.1 x 14.9 cm / 21.4 x 8.7 x 5.9 in
Unit Weight	
Standard Version	9.0 kg / 19.8 lbs
With Disconnect Box	12.8 kg / 28.1 lbs
Maximum Wire Size	
Power Terminals	2.5 mm^2 - 35 mm^2 / 14 AWG - 2 AWG
RTS/Sense Terminals	0.25 mm^2 - 1.0 mm^2 / 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 and RoHS Compliant
- ETL Listed: UL-1741 and Canadian CSA C22.2 No. 107.1.01
- FCC Class B Part 15 Compliant
- U.S. National Electrical Code (NEC) Compliant
- Manufactured in a Certified ISO 9001 Facility

Options

- TriStar 600V Meter (TS-M-2-600V)
- TriStar Remote Meter (TS-RM-2)
- Meter Hub (HUB-1)
- Relay Driver (RD-1)

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

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www.morningstarcorp.com

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