**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
TRISTRAR MPPT™ 600V CHARGE CONTROLLER

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
- 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 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 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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World’s Leading Solar Controllers & Inverters
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PRINTED IN USA  600VDAT.6/14.EN