MORNINGSTAR
World's Leading Solar Controllers & Inverters

TriStar™

THREE-FUNCTION SOLAR CONTROLLER

Morningstar's TriStar Controller is a three-function controller that provides reliable solar battery charging, load control or diversion regulation. The controller operates in one of these modes at a time and two or more controllers may be used to provide multiple functions.

The TriStar uses advanced technology and automated production to provide exciting new features at a competitive cost. The optional TriStar meter is the most sophisticated and informative controller meter on the market. The controller is UL listed and is designed for both solar home systems and professional applications.

Product shown with optional meter.

Key Features and Benefits

Highest Reliability

Large heat sink (1) and conservative design enables operating at full ratings to 60°C. No need to de-rate.

More Power

Ratings to 60A at 48VDC will handle solar arrays up to 4kW.

Communications Capability

RS-232 (2) connects to a personal computer for custom settings, data logging and remote monitoring and control.

Fully Adjustable

DIP switch (3) provides user with a choice of 7 different digital presets and custom settings via RS-232.

Extensive Electronic Protections

Fully protected against reverse polarity, short circuit, overcurrent, high temperature and overvoltage.

Simple Mechanical Interface

Larger power terminals (4) and conduit knockouts (5). Extra space for wire turns. Fits on power panels.

Better Battery Charging

Connecting battery sense wires (6) and optional remote temperature sensor (7) will improve control accuracy. Constant voltage series PWM algorithm increases battery capacity and life.

More Information

3 LED's (8) to indicate status, faults and alarms. Optional meter (9) displays extensive system and controller information, automatic self-test and reset capabilities. Meter connection via RJ-11 phone jack (10).

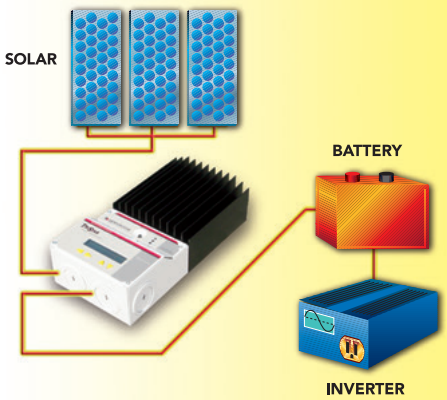
Easy to Reset

Pushbutton (11) provides manual reset and stop/start battery equalization or load disconnect.

Low Telecom Noise

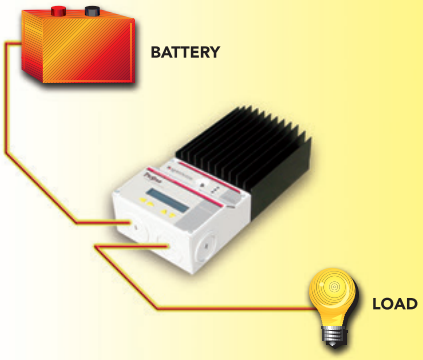
DIP switch setting will change PWM to "On-Off" battery charging.

CHARGE CONTROL



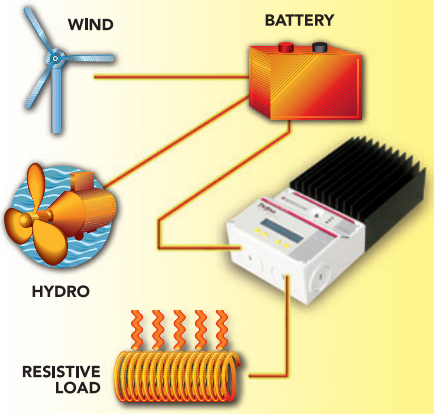
- Constant voltage series PWM design to provide highly efficient battery charging
- 4-stage charging to increase battery capacity and life: bulk charge, PWM regulation, float and equalize
- Parallel for larger solar arrays up to 300 amps or more

LOAD CONTROL



- Starts large loads including motors and pumps with no damage to controller
- Allows inrush current to 300 amps
- Electronic short-circuit and overload protection with automatic reconnect
- LVD is current compensated and has a delay to avoid false disconnects

DIVERSION CONTROL



- May be used for solar, wind or hydroelectric
- To protect against battery overcharge, excess energy is diverted from the battery to an alternate DC resistive load
- PWM reduces power into diversion load during overcurrent conditions

Electrical Specifications

- Rated solar, load or diversion current:
  - TriStar-45 — 45A
  - TriStar-60 — 60A
- System Voltage — 12-48V
- Accuracy — 12/24V: ≤0.1% ±50mV; 48V: ≤0.1% ±100mV
- Min. voltage to operate — 9V
- Max. solar voltage (Voc) — 125V
- Self-consumption:
  - Controller — <20mA
  - Meter — 7.5mA

Environmental Specifications

- Operating ambient temperature:
  - Controller — –40°C to +60°C
  - Meter — –40°C to +60°C
- Storage temperature: –55°C to +85°C
- Humidity: 100% (non-condensing)
- Tropicalization: Conformal coating on both sides of all printed circuit boards

Electronic Protections

- Reverse polarity protection (any combination)
- Short-circuit protection
- Overcurrent protection
- Lightning and transient surge protection using 4500W transient voltage suppressors
- High temperature protection via automatic current reduction or complete shut down
- Prevents reverse current from battery at night

Mechanical Specifications

- Dimensions: Height: 26.0cm/10.3 inch; Width: 12.7cm/5.0 inch; Depth: 7.1cm/2.8 inch
- Weight: 1.6 kg/3.5 lb
- Largest Wire: 35mm²/2 AWG
- Conduit knockouts: Eccentric 2.5/3.2 cm (1.0/1.25 inch)
- Enclosure: Type 1, indoor rated

TriStar Options:

- TriStar Meter — 2 x 16 display mounts to controller and provides system and controller information, data logging, bar graphs and choice of 5 languages

- TriStar Remote Meter — Includes 30 meters of cable for mounting meter away from the controller
- Remote Temperature Sensor — Provides temperature compensated charging by measuring temperature at the battery (10 meter cable)

Certifications

- CE Compliant
- UL Listed (UL 1741)
- cUL (CSA-C22.2 No.107.1-95)
- Complies with U.S. National Electric Code
- Manufactured in a certified ISO 9001 facility

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

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