

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 ETL Listed (UL1741) and TUV (IEC62109-1), and is designed for home systems and professional applications.



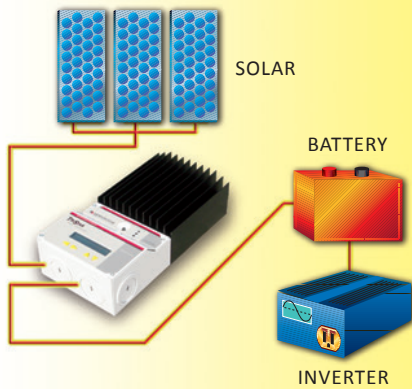
45 or 60 amps
at 12-48 volts

KEY FEATURES AND BENEFITS

- **High 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.

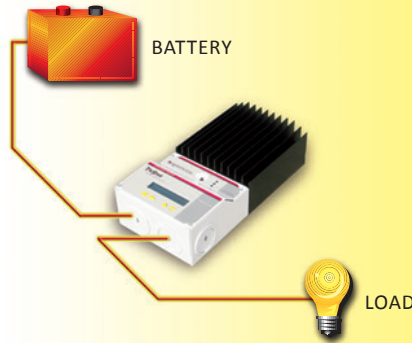


CHARGE CONTROL



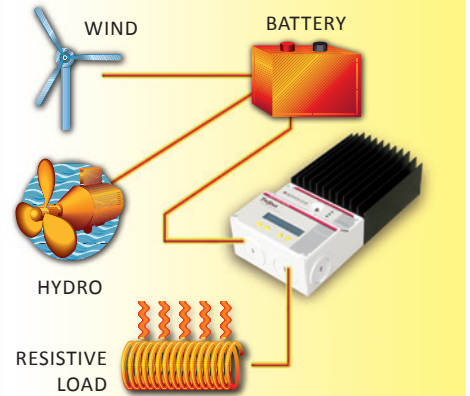
- Constant voltage series PWM design to provide highly efficient battery charging
- 4-stage charging to increase battery capacity and life: bulk charge, PWM regulation, float and equalize
- Parallel for larger solar arrays up to 300 amps or more

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

TECHNICAL SPECIFICATIONS

Electrical

- 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
- Minimum voltage to operate 9V
- Maximum solar voltage (Voc) 125V
- Self-consumption

Controller	<20mA
Meter	7.5mA

Mechanical

- Dimensions

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

Environmental

- 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

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

13.5v	25c	12.3A	V	14.4 V	1135	7Ah
1234.5Ah	FLOAT	A		12.3 V	11.3	kWh

- **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
- ETL Listed (UL 1741)
- cETL (CSA-C22.2 No.107.1-95)
- TUV (IEC 62109-1)
- Complies with U.S. National Electric Code
- Manufactured in a certified ISO 9001 facility
- MET Labs (EN 60335-1, EN 60335-2-29)



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

Revision: 4/2016.EN
Control no. MS-001798
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