PS200

Smart 12 V Power Supply with Charging Regulator and 7 Ah Rechargeable Battery

Optimized Power Performance

Manages voltage and amperage to protect battery

Overview

The PS200 is a 12-Vdc battery with a charge controller. The controller manages amperage and voltage for safe, optimized battery charging from a solar-panel or AC power source. It also measures various input, output, and status parameters to allow close monitoring of the battery during charging and use. The

PS200 includes a 12-Vdc lead-acid battery, while the CH200 is for use with a user-supplied battery.

Note: If you do not need or desire the 6182 7 Ah Sealed Rechargeable Battery that is shipped with the PS200, consider ordering the 22238 instead.

Benefits and Features

❯ Protects against high-amperage and high-voltage damage to power supply

❯ Ability to monitor both load and battery current

❯ Battery reversal protection

❯ Real-time measurements of charge input voltage, battery voltage, on-board temperature, battery current, and load current

❯ Two-step constant voltage charging and temperature compensation optimize battery charging and increase the battery's life

❯ Allows simultaneous connection of two charging sources (e.g., solar panel, ac wall charger)

Detailed Description

The PS200 power supply consists of a rechargeable, 7 A h, valve-regulated lead-acid (VRLA) battery and a charging regulator. This microcontroller-based smart charger has two-step constant voltage charging and temperature compensation that optimize battery charging and increase the battery's life.

Two input terminals enable simultaneous connection of two charging sources. The PS200 also incorporates a maximum power point tracking algorithm for solar inputs that maximize available solar charging resources. RS-232 and SDI-12 terminals allow the PS200 to convey charging parameters to a data logger.

The PS200 has several safety features intended to protect the charging source, battery, charger, and load devices. Both the SOLAR – G and CHARGE – CHARGE input terminals incorporate hardware current limits and polarity-reversal protection.

A fail-safe, self-resettable thermal fuse protects the CHARGE – CHARGE inputs in the event of a catastrophic AC/AC or AC/DC charging source failure. Another self-resettable thermal fuse protects the 12 V output terminals of the charger in the event of an output load fault.

The PS200 also has battery-reversal protection, and includes ESD and surge protection on all of its inputs and outputs.

Specifications

Operational Temperature	-40° to +60°C (VRLA battery manufacturers state that "heat kills batteries" and recommend operating batteries at ≤ 50°C.)
Dimensions	19 x 7.6 x 10.6 cm (7.5 x 3 x 4.2 in.)

CHARGE - CHARGE Terminals (AC or DC Source)

AC	18 to 24 VRMS (with 1.2 ARMS maximum)
DC	16 to 40 Vdc (with 1.1 Adc maximum)

SOLAR Terminals (Solar Panel or Other DC Source)

-NOTE-	*Battery voltages below 8.7 V may result in less than 3.0 A current limit because of fold-back current limit.*
Input Voltage Range	15 to 40 Vdc
Maximum Charging Current	4.0 Adc typical (3.2 to 4.9 Adc depending upon individual charger)

Quiescent Current

No Charge Source Present	300 µA maximum
No Battery Connected	2 mA maximum

Battery Charging

-NOTE-	*Two-step temperature-compensated constant-voltage charging for valve-regulated lead-acid batteries; cycle and float charging voltage parameters are programmable with the default values listed.*
CYCLE Charging	$Vbatt(T) = 14.70 V - (24 mV) \times (T-25°C)$
FLOAT Charging	$Vbatt(T) = 13.65 V - (18 mV) \times (T-25°C)$
Accuracy	±1% (on charging voltage over -40° to +60°C)

Power Out (+12 Terminals)

Voltage	Unregulated 12 V from battery
4 A Self-Resettable Thermal Fuse Hold Current Limit	》 > 4 A (< 20°C) 》 2.7 A (60°C) 》 3.1 A (50°C) 》 4.0 A (20°C)

Measurements

-NOTE-	*At -40° to +60°C*
Average Battery Voltage	±(1% of reading + 15 mV)
Average Battery/Load Current Regulator Input Voltage	±(2% of reading + 2 mA) Impulse type changes in current may have an average current error of ±(10% of reading + 2 mA).
Solar	±(1% of reading - 0.25 V) / -(1% of reading + 1 V) 1.0 V negative offset is worst-case due to reversal protection diode on input; typical diode drop is 0.35 V.
Continuous	±(1% of reading - 0.5 V) / -(1% of reading + 2 V) 2.0 V negative offset is worst-case due to two series diodes in AC full-bridge. Typical diode drops are 0.35 each for 0.7 V total.
Charger Temperature	± 2°C

For comprehensive details, visit: www.campbellsci.com/ps200