PS200 and CH200
Smart Power Supply and Charge Controller

Optimized Power Performance

Manages voltage and amperage to protect battery

Overview

The PS200 and CH200 are charge controllers that manage amperage and voltage for safe, optimized battery charging from a solar-panel or ac power source. They also measure various input, output, and status parameters to allow close monitoring of the battery during charging and use. The PS200 includes a 12 Vdc valve-regulated lead-acid (VRLA) battery, while the CH200 is for use with a separate larger battery such as our BP12, BP24, or a user-supplied battery.

Benefits and Features

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

> Ability to monitor both load and battery current

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

> Battery reversal protection

> 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)

Technical Description

The PS200 and CH200 are micro-controller-based smart chargers with 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. They also incorporate a maximum power point tracking algorithm for solar inputs that maximize available solar charging resources. RS-232 and SDI-12 terminals allow the PS200 and CH200 to convey charging parameters to a datalogger.

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 and CH200 also have battery-reversal protection, and include ESD and surge protection on all of its inputs and outputs.

Ordering Information

Power Supplies

CH200	12 V Charging Regulator
PS200	12 V Power Supply with Charging Regulator and 7 Ah Sealed Rechargeable Battery

12 Vdc Battery Packs for CH200

BP12	12 Ah Sealed Rechargeable Battery with Mounts
BP24	24 Ah Sealed Rechargeable Battery with Mounts

Wall Chargers

29796	Wall Charger 24 Vdc 1.67 A Output, 100 to 240 Vac, 1A Input, 5 ft Cable. Must choose a power plug option (see below).
22110	Wall Charger 24 Vdc 1.67 A Output, 100 to 240 Vac, 1A Input for prewired enclosure. Must choose a power plug option (see below).

Power Plug Options (choose one)

-US	US/Canada Plug
-IP	7 International Plugs

Ordering Information Continued

Unregulated Solar Panels

Regulated solar panels such as the SP10R are not recommended. Must choose a cable termination option and a mounting option.

SP10   10 W Solar Panel with 15 ft cable

SP20   20 W Solar Panel with 15 ft cable

SP50-L   50 W Solar Panel with user-specified cable length (used with the CH200 only). Enter length, in feet, after the -L. A 20 ft length is typical; maximum length is 50 ft.

Cable Termination Options (choose one)

-PT   Cable terminates in stripped and tinned leads for direct connection to the CH200 or PS200.

-PW   Cable terminates in a connector that attaches to a prewired enclosure.

-C   Cable terminates in a connector that attaches to an ET station or the CS110 Electric Field Meter (only available for the SP10).

Mounting Option (choose one)

-SM   Standard Mounting Kit

-EM   Extended Mounting Kit

Cables (interface and external battery)

20769   SDI-12 Interface Cable with a 2 ft length. Connects the power supply's SDI-12 terminal to the datalogger's terminals, allowing the datalogger to receive the power supply's charging, load, battery voltage and current information.

25356   RS-232 Pigtail Interface Cable with a 2 ft length. Connects the power supply's RS-232 terminal to the datalogger's terminals, allowing the datalogger to receive the power supply's charging, load, battery voltage and current information.

20770   9-pin RS-232 Interface Cable with 6 ft length. Connects a PS200 or CH200 to a computer for changing its settings or downloading a new operating system.

6186   Battery Cable for connecting a an external 12 Vdc flooded battery such as a deep-cycle marine or RV battery.

Adapters

Only one adapter can be used at a time.

A100   Null Modem Adapter for powering peripherals and external devices at non-datalogger sites such as repeater stations.

A105   12 V Terminal Expansion Adapter that increases the number of 12 V and ground terminals available on the PS200 or CH200.

Specifications

❯ Operational Temperature[a]: –40° to +60°C

❯ View EU Declaration of Conformity at: www.campbellsci.com/ch200 or www.campbellsci.com/ps200

❯ Dimensions:

	Height	Length	Width
PS200	10.6 cm (4.2 in)	19 cm (7.5 in)	7.6 cm (3 in)
CH200	10 cm (3.9 in)	7.5 cm (3 in)	3.7 cm (1.5 in)

CHARGE – CHARGE Terminals (AC or DC Source)

❯ AC: 18 to 24 V RMS with 1.2 A RMS maximum

❯ DC: 16 to 40 Vdc with 1.1 A dc maximum

SOLAR Terminals (Solar Panel or Other DC Source)[b]

❯ Input Voltage Range: 15 to 40 Vdc

❯ Maximum Charging Current: 4.0 Adc typical; 3.2 Adc 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[c]

❯ CYCLE Charging: $Vbatt(T) = 14.70 \text{ V} - (24 \text{ mV}) \times (T - 25°C)$

❯ FLOAT Charging: $Vbatt(T) = 13.65 \text{ V} - (18 \text{ mV}) \times (T - 25°C)$

❯ Accuracy: ±1% accuracy 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 Limits

<20°C	20°C	50°C	60°C
> 4 A	4.0 A	3.1 A	2.7 A

Measurements

❯ Average Battery Voltage (-40° to +60°C): ±(1% of reading + 15 mV)

❯ Average Battery/Load Current Regulator Input Voltage (-40° to +60°C)[d]: ±(2% of reading +2 mA)

❯ Solar (-40° to +60°C)[e]: ±(1% of reading − 0.25 V) / −(1% of reading + 1 V)

❯ Continuous (-40° to +60°C)[f]: ±(1% of reading − 0.5 V) / − (1% of reading + 2 V)

❯ Charger Temperature: ± 2°C

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[a]*VRLA battery manufacturers state that "heat kills batteries" and recommend operating batteries ≤50°C.*

[b]*Battery voltages below 8.7 V may result in <3.0 A current limit because of fold-back current limit.*

[c]*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.*

[d]*Impulse type changes in current may have an average current error of ±(10% of reading + 2 mA).*

[e]*1.0 V negative offset is worst-case due to reversal protection diode on input. Typical diode drop is 0.35 V.*

[f]*2.0 V negative offset is worst-case due to two series diodes in AC full-bridge. Typical diode drops are 0.35 V each for 0.7 V total.*