



Naps MMini Pro Charge Controller for Small Industrial Solar Electric Systems

Naps MMini Pro is a microprocessor-based solid state shunt controller with temperature compensation. It is designed for use in small professional solar electric systems. Naps MMini Pro incorporates a 10 Amp charge circuit and two 7 Amp load circuits.

A new and unique feature of the Naps MMini Pro is the possibility to configure one of the load circuits for night-time lighting, active only when there is no daylight detected by the solar electric array.

Low voltage load disconnect (LVD), overvoltage protection and battery type selection are all provided. Front panel indication is by LEDs which indicate solar electricity charging and LVD status.

Reverse night-time current flow is prevented by an integral, low loss blocking diode.

Naps MMini Pro's solid state charging circuitry provides fast and accurate charging and keeps batteries fully charged whenever possible. Naps MMini Pro gives vented lead-acid batteries an additional boost charge for improved recovery from deep discharges, thus enhancing battery life.

Easily accessible screw terminal blocks for cable sizes up to 6 mm^2 are provided for the module, battery and two load circuits.

The high reliability design gives a calculated MTBF in excess of 2 million hours and a design lifetime of more than 16 years. Naps MMini Pro has a warranty period of two (2) years from the date of purchase.

For special systems projects, a variety of options are available for Naps MMini Pro.

Naps MMini Pro Features

Solid state charging

Once the battery voltage limit is reached, the charging current is pulsed to maintain the battery at this voltage for the rest of the day.

Temperature compensation

Naps MMini Pro adjusts the charging voltage for ambient temperature changes. This results in full charging during the winter without fear of overcharging during the summer.

Automatic boost charging

If the battery has received a deep discharge (over 60 %), Naps MMini Pro will ensure that it is first charged to a higher voltage than normal. Once this voltage has been reached, charging reverts to the normal mode. This feature operates for open (vented) batteries only.

Selection of battery type and system voltage

The factory settings are for a 12 V system with a sealed (VRLA) battery, but can be easily changed to 24 V and/or open (flooded) batteries.

Reverse current protection

An integral Schottky blocking diode prevents the battery discharging through the photovoltaic array at night.

Load Circuits

The controller has two load circuits, each capable of handling 7 A continuous load current and each with independent overload protection.

Lighting control

Load 1 circuit can be used in "dusk till dawn" lighting control mode. The controller uses the solar electric module as light sensor and switches Load 1 on when it gets dark and off when the module is illuminated. Load 2 circuit operates as a normal, continuously on, load circuit. The lighting control mode is easily selected using a jumper.

Battery deep discharge protection

Fully discharging the battery may damage it and may cause it to freeze. Naps MMini Pro has a battery deep discharge protection which disconnects the loads from the battery if there is a of deep discharge. A built-in delay prevents nuisance tripping.

Overvoltage protection

Fast-acting semiconductor transient overvoltage suppressors protect all terminals. Additionally, the loads are disconnected automatically if the battery voltage is abnormally high, and automatically reconnected after a short delay if normal battery voltage is restored.

EMC

Naps MMini Pro fully complies with the EU EMC directive and proposed IEC solar electric systems standards.

Reliability

Fully solid state design using industrial grade components with

ample design margins ensures high reliability and a design lifetime of more than 16 years.

Solar elctricity charge indicator

A yellow LED is continuously lit when the solar electric array is charging and it will start to flash when the battery approaches full charge.

Battery status warning and LVD indicator

A red LED will start to flash if the battery has less than approximately 40 % capacity left. If the LVD has operated the indicator will be continuously on until the battery voltage has risen sufficiently to reset the LVD circuit.

Specifications

Product code		41605
Nominal system voltage		12 / 24 V
Maximum array current		10 A
	12 \	/ 24 V
Maximum array voltage	25 \	/ 47 V
End-of-charge voltage +25°C	14.2 \	/ 28.4 V
Maximum charge voltage -25°	15.6 \	/ 31.2 V
Temperature compensation	-30 mV/ (approx	° -60 mV/°) (approx)
Load circuits	2 x 7 /	A 2 x 7 A
Low voltage disconnect (LVD)	11.3 \	/ 22.6 V
LVD delay	1 minute	e 1 minute
LVD reconnect	12.9 \	/ 25.8 V
Load overvoltage disconnect	15.7 \	/ 31.4 V
Load overvoltage reconnect	12.9 \	/ 25.8 V
Load 1 night-only operationjumper selectable		
Current consumption (typical)	4 m/	4 mA
Display LEDs		1 solar current
		2 LVD status
PCB protection		lacquered
Ambient temperature range		-40 °C +45 °C
Dimensions		150 x 80 x 30 mm
Weight		0.19 kg
Tolerance for electrical values ty	pically	< +/- 1.5 %
Jumper-selectable options		
Nominal Voltage		12 V* or 24 V
Battery type		VRLA* or open
Load 1 operation		24 h* or night only
* indicates factory setting		

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