PHOTOVOLTAIC CHARGE CONTROLLER

RSD30

RSD50

Soluciones Energéticas S.A.

AV Real de Pinto, 146 - 28021 Villaverde Alto, Madrid

Phone 91 539 27 00

https://www.solener.com solener@solener.com

User guide version 1.1.2006, for controllers version 3.04

Soluciones Energéticas S.A.
AV Real de Pinto, 146
28021 Villaverde Alto, Madrid
Phone: 91 539 27 00
https://www.solener.com
solener@solener.com

INSTALLATION

The RSD controller itself is protected against polarity inversions, but you must be careful when connecting it because the loads and even the modules can be damaged when the battery polarity is reversed. **It is important to follow this connection order:**

1º.- Battery connection. If no LED turns on, or you hear a buzzing sound, **STOP CONNECTING** and check battery polarity.
2º.- Module connection.
3º.- Load connection.

When disconnecting you must execute the steps above in reverse order. The controller is protected against battery disconnection while the modules are still connected, but the loads may be damaged.

The initial charge mode is Equalization for vented batteries and Bulk for sealed batteries. Equalization repeats automatically once per month or when the loads are disconnected due to a low battery condition.

CHARACTERISTICS

Physical

Length × width × height:	172 × 160 × 24 mm
Weight:	0,4 kg
Enclosure:	Galvanized steel
Paint:	Epoxy
Environmental protection:	IP32
Operation temperature range:	-10 a +50 ºC
Screen temperature range:	-2 a +50 ºC

Electrical

Nominal voltage (automatic selection):	12/24 or 24/48 V
Maximum module voltage:	50/60 or 85/105 V
Maximum module current:	30 or 50 A
Maximum load current:	30 A
Admissible overload (continuous):	25 %
Self consumption:	< 10 mA
Power loss input/output:	~ 3.1/1.0 W (30 A)
Input smart diode:	Only in the 30 A model

Operation

Charge control:	Solid state, in series
Battery:	Field settable, 4 options

Other

- Low and high battery voltage, overload and short circuit alarms reported with LED, LCD display and acoustic signal. The acoustic signal can be silenced temporarily pressing a key or forever (if it bothers somebody) by removing an internal jumper marked BZ.

- The display shows information about battery voltage, input and output currents and powers, temperature, energy charged and consumed, charging stage, alarms, peaks...
- Overload protection allows short current peaks (similar to a slow-action fuse) for motor starting.
- Protection against voltage spikes in all inputs (TVS).
- Tropicalized electronic boards.
- Temperature compensated.
- Automatic load reconnection when the battery charges.

A short circuit in the output makes the controller disconnect the output permanently. For manual reactivation you must press the RESET button after removing the short.

The controller has a temperature probe in the bottom at the end of a short wire. This probe must be left as is, hanging free.

DESCRIPTION

The **SOLÉNER RSD** charge controller has been designed and built by **SOLUCIONES ENERGÉTICAS, S.A.** for photovoltaic isolated systems using lead-acid batteries. It is reliable, versatile and easy to use in solar home systems (SHS). It is compact and the installation is straightforward.

The smart diode blocks current flow from the battery to the modules at night, and has very low losses when the current flows from modules to battery. It is not an usual diode, so do not make assumptions about how it works.

STATUS INDICATORS

The two LED in the left side show controller's status:

- The yellow LED indicates the charge mode: **ONE** blink per second indicates floating mode, **TWO** bulk mode and **THREE** equalization mode. It stays on when the red LED stays on.

- The red LED blinks when the input or output current is greater than the nominal. It stays on when this happens more than three seconds, a short circuit is detected or battery voltage is too high. When this LED stays on the related input or output will be shutdown until the RESET button is pressed.

Warning: if the controller detects an overload or short circuit please locate and remove the culprit before pressing RESET.

The acoustic (and visual) low battery alarm indicates that the battery has low remaining charge and the load will be disconnected soon. The user should disconnect non-critical loads so the battery has the opportunity to recover.

The high battery alarm usually indicates a problem in the installation (battery with low electrolyte level, rusted bridges or loose screws...). Please call your installer as soon as possible, because there is a risk of damage or even fire.

BATTERY INDICATORS

The three LED at the right side indicate battery status:

- The red LED blinks when battery voltage is low. It stays on when the output is shutdown to protect the battery from excessive discharge. The output will be reconnected automatically when the battery recovers part of the charge.

- The yellow LED blinks when the battery is in and intermediate state (somewhere between low and full charge).

- The green LED blinks when the battery is near full charge. It stays on when the controller disconnects the input switch because the battery is fully charged.

LCD SCREEN

The controller's screen shows information about system status. Usually the information changes automatically every four seconds, but the user can change it at will using the NEXT button, and then the current screen will last 30 seconds. The information includes:

- Serial number and software version.
- Battery voltage and selected battery.
- Battery status and charge mode.
- Current, minimum and maximum temperature.
- Energy since last reset (in W·h).
- Input power, current and peaks.
- Output power, current and peaks.

The information on screen can be in english or spanish (french and portuguese are available on order), depending on jumper **JPC** position in the PCB. The default value is Spanish.

JPC	LANGUAGE
OFF	SPANISH
ON	ENGLISH

The user can select one battery (out of four) using jumpers **JPA** y **JPB**. See the table in the last page for more information. The battery selected in factory is **Tubular vented**.

Warning: battery selection is important to get the most of the battery.

Warning: the *beacon function* changes the output behaviour, activating it only at night. This function allows the use of the controller for street lights, beacons and other. The 50 A model does not have smart diode, so the beacon function is not available and the output never activates.

JPB	JPA	BATTERY
OFF	Off	Tubular vented
OFF	On	SOPzS
On	Off	Tubular gel
On	On	AGM*

Battery selection

	TUBULAR VENTED	SOPzS	TUBULAR GEL	AGM*
HIGH VOLTAGE ALARM	15,75	15,90	15,56	15,80
EQUALIZATION BAND	14,70 / 15,00	14,00 / 14,40		
BULK CHARGE	14,70	15,60	14,70	14,70
FLOATING BAND	13,80 / 14,40	13,50 / 13,80	13,80 / 14,40	13,80 / 14,40
BULK START	12,62	12,62	12,62	12,62
LOW VOLTAGE ALARM	11,12	11,37	11,12	11,12
LOAD DISCONNECTION	11,00	11,25	11,00	11,00
LOAD RECONNECTION	13,00	13,00	13,00	13,00

**on order this selection includes beacon function (only in 30 A models, see page 7)*

- These voltages are for 12 V systems; if the system is a 24 V one you must use them doubled, and double them again for 48 V systems.

- These voltages are nominal at 25 ºC. The controller is temperature compensated, so the final voltage will be slightly different.

- If your battery is not in this table check manufacturer's data and select the closest match. If your battery is vented (i.e. can be refilled) you must select the first or second column.

- The 60-cell modules are popular and cheap because they are used in big grid-connected installations, but they **CAN'T BE USED** in battery systems. In a 12 V system you must use 36 to 40-cell modules, while in a 24 V system you must use 72 to 80-cell modules (or two 12 V modules in series).