98 North Washington St.
Suite 210
Boston, MA 02114
1-844-OPTIRTC
www.optirtc.com

Opti Solar Battery Replacement Guide

Last Updated: March 2024

Last Revised: *March 1, 2024*

Recurring Overnight Offline Periods – Solar Power Only

Batteries will degrade over time and eventually require replacement. In this example, a site experiences recurring offline periods overnight. Batteries will be disconnected when their voltage drops below 22.8V and will reconnect once they have been charged such that the voltage exceeds 25.2V. During the daytime hours the solar panel generates enough energy to operate the Opti system; as the sun sets the batteries rapidly lose charge and the site goes offline (Figure 1). The system needs to be energized and de-energized in a specific order to safely replace the batteries and protect system components, described below.

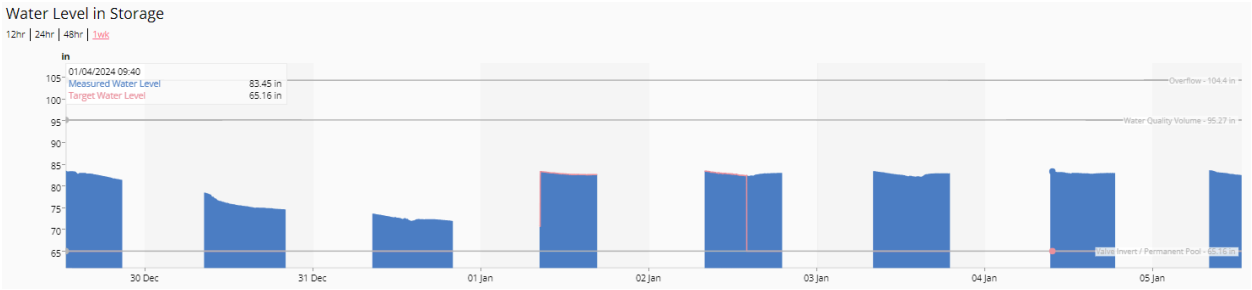


Figure 1: Recurring offline periods during overnight hours

Control Panel De-Energizing Procedure

Whenever maintenance is required, the control panel and components must first be de-energized. The steps below outline the de-energizing procedure:

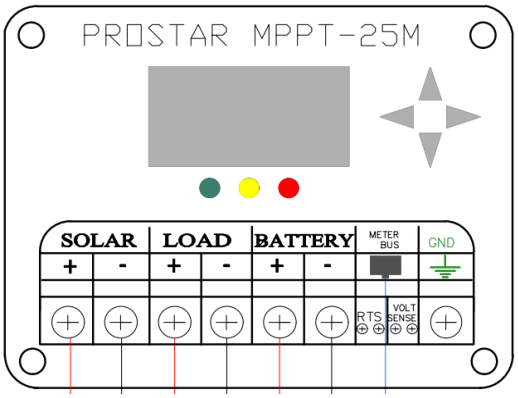
Unlock the control panel enclosure and access the swing panel.

1. Turn the Control Power switch to the off position.
2. Open the swing panel. Locate the panel circuit breakers, labeled CB1 and CB2, and turn them down to the off position.

All connected devices are now de-energized and maintenance can proceed. **Note that this does not de-energize the input energy source in the site's solar kit or line power connection.**

De-energize the solar power system:

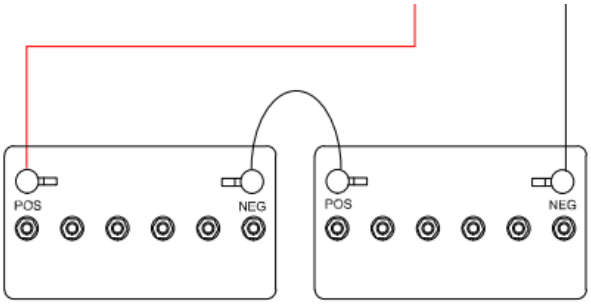
- Open solar kit box and identify three breakers in line with the charge controller: Solar, Load, Battery



- Trace the wires from the charge controller to each breaker to confirm each breaker's purpose
- Turn the breakers to the OFF position in the following order
    - Solar breaker off first
    - Load breaker off second
    - Battery breaker off last

The system is now de-energized and the battery can be replaced. Please note the battery will remain charged and a sunlit solar panel will still produce energy; continue to work with caution.

- Remove battery cables from batteries, then remove batteries from box
- Install new batteries (terminal protectant grease is recommended but not required)
    - Connect positive and negative terminals of one battery to the other to join them in series
    - Connect the remaining positive cable to one battery and the remaining negative cable to the other battery
    - Check that nuts securing battery leads are torqued tight enough to prevent slipping as any movement due to heat expansion, etc could cause a short.



The battery replacement is now complete and the system is ready to be re-energized. While the breakers are still in the OFF position, check connections for tightness and polarity.
Re-energize the system:

- Turn the battery breaker ON first
    - Verify voltages to the battery
- Turn the solar breaker ON second
    - Verify charging amps
- Proceed to turn the load breaker ON

The system is now re-energized and should be operating normally. To verify your Opti system is online, open the control panel and check the OptiThunder status indicator lights. When the status indicator light is breathing cyan your Opti system is connected to the cloud. Additionally, please verify on your site's dashboard that Opti Thunder is able to read data from the solar charge controller. If something looks off or this data is not available on your dashboard, please contact Opti Support.

Opti Certified Hardware Program | *Replacement Battery*

Opti's Certified Hardware Program has identified the Deka Solar 8G31 12V 108Ah battery as a standard component of the solar kit. Both batteries should be replaced at the same time to support even charging and energy consumption; failure to do so can result in diminished battery life. A solar battery typically lasts 3-5 years. Replacement batteries can be sourced from Opti or directly from the manufacturer. Any battery with similar specifications should have similar performance and can be installed at the customer's risk. Opti Support is available by phone or email to answer questions and assist in hardware procurement.

Opti Support: support@optirtc.com | 844-678-4782 ext. 02

8G31-DEKA

SPECIFICATIONS

Nominal Voltage (V)	12V
Capacity at C/100	108Ah
Capacity at C/20	97.6Ah
Weight	70 lbs. (31.8 kg)
Plate Alloy	Lead Calcium
Posts	Forged Terminals & Bushings
Container/Cover	Polypropylene
Operating Temperature Range	-76°F (-60°C) - 140°F (60°C)
Charge Voltage @ 68°F (20°C)	
Cycle	2.30 - 2.35VPC
Float	2.25 - 2.30VPC
Vent	Self-sealing
Electrolyte	Sulfuric acid thixotropic gel
Terminal	X (STUD)

Rated non-spillable by ICAO, IATA and DOT

Made in the U.S.A. by East Penn Manufacturing Co, Inc.

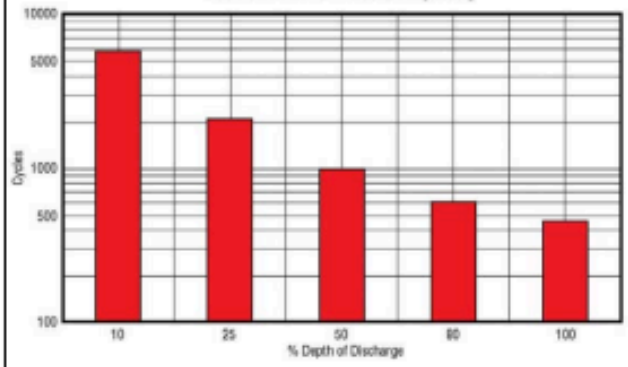
Distributed by:

Valve-Regulated, Gelled-Electrolyte Battery

DIMENSIONS

Length (mm)	**12.93 (329 mm)**
Width (mm)	**6.75 (171 mm)**
Height (mm)	**9.34 (237 mm)**

Gel Cycle Life vs Depth of Discharge at +25°C (77°F)
Based on BCI 2-hour Capacity



MK Battery
1631 South Sinclair Street • Anaheim, California 92806
Toll Free: 800-372-9253 • Fax: 714-937-0818 • E-mail: sales@mkbattery.com