

Preparing Your Solar System for Winter Key Insights and Tips



As the winter months approach, solar system owners face unique challenges due to reduced sunlight hours and lower temperatures. At Solis, we understand that maintaining the performance of your photovoltaic (PV) system and battery is essential to ensuring reliable energy supply throughout the colder months. With the right precautions and adjustments, your solar inverter and battery can continue to function optimally, even in winter conditions.

In this article, we will guide you through the key points to consider as the temperatures drop, with a special focus on protecting your hybrid inverter and battery system from the effects of winter weather.

Effects of Low Temperature on Inverter and Battery Operation

1. Voltage Fluctuations:

Cold temperatures can lead to fluctuations in voltage levels. Monitoring voltage output is crucial to prevent any impact on system performance.

2. Temperature-Sensitive Components:

Certain internal components, especially batteries, may be sensitive to lower temperatures. Ensuring they are adequately protected can prevent potential malfunctions.

3. Fan Operation:

High-power inverters use external fans to dissipate heat. In winter, external fans can freeze, limiting their ability to regulate temperature. It's important to keep an eye on fan performance in cold conditions.

4. Battery Performance:

Low temperatures can slow the chemical reactions in batteries, reducing their capacity and performance. This could lead to diminished energy output during critical times. In severe cases, cold weather can cause batteries to enter a deep discharge state, potentially leading to shutdown.

5. State of Charge (SOC) Challenges:

Calculating the SOC in low temperatures can be tricky, especially when batteries idle for long periods in winter. Parasitic discharge from the inverter and battery management system (BMS) continues even when the system is idle, leading to gradual depletion of the battery. Additionally, minimal PV generation in winter means batteries may not reach full charge for weeks, if not months.



Protective Measures and Operational Insights for Winter

To protect your inverter and battery system during the colder months, we recommend the following strategies:

1. Strategic Installation:

Install your inverter indoors or in shielded locations to protect it from direct exposure to cold air or snow. This is especially helpful for the 5G and S6 series, which are designed to adapt to low temperatures.

2. Auxiliary Cold Protection:

Consider external or built-in heaters for your inverter system. These can gradually warm up the system, ensuring reliable operation even in extremely cold environments.

3. Internal Preheating and Heat Preservation:

Our Solis inverters come equipped with advanced preheating functions that help maintain a stable operating temperature. This feature is particularly useful in ensuring efficient energy conversion during cold spells.

Solis Recommendations for Winter Operation

- 1. Switch Off the Battery (in low PV conditions):**
We generally recommend switching off the battery in winter when PV generation is low. Before doing so, ensure the battery is charged to around 50% and change the inverter setting to "No Battery."
- 2. Regular Monitoring and Maintenance:**
It's important to keep a close eye on your system, especially in winter. Make sure all components are functioning correctly to avoid any sudden drops in performance. Watch out for deep discharges in the battery.
- 3. Use Time Charging:**
To prevent deep discharges, regularly charge the battery from the grid using the "Time Charging" function. This will help preserve battery life during the winter months.
- 4. Optimize Charging and Discharging Settings:**
Adjusting your battery's charging and discharging settings for winter can help preserve its capacity. For instance, setting the Overdischarge SOC at 40% and the Forcecharge SOC at 30% could help extend battery life.
- 5. Emergency Power Operation:**
If you use your system for backup operation, make sure the battery is fully charged and operational in winter. The battery is used to provide backup power, so if you do not intend to use the backup mode, it should be deactivated.
- 6. Ensure Adequate Charging Capacity:**
Since sunlight is limited in winter, you may need to adjust energy consumption patterns or rely on grid charging to maintain adequate battery levels. Be sure to take advantage of the grid charging time feature on your inverter.
- 7. Inverter Firmware**
Ensure that your inverter has the latest firmware installed. If you are unsure about your firmware version, please do not hesitate to contact your local Solis service team.



Special Features of the S6 Series for Winter

Our latest S6 generation offers advanced features to help optimize battery performance in winter:

- **Battery Healing Switch:**
This feature allows for accurate SOC readings, even when the battery remains at a low charge for extended periods. It helps ensure a healthy battery over time.

- **Overdischarge Hysteresis SOC:**
Designed to avoid premature discharges when the battery is in an overdischarged state, this feature helps maintain proper charge levels throughout the winter.
- **Battery Wakeup Switch:**
This function powers the battery port and restores BMS communication in cases where the battery needs a wakeup command during winter dormancy.

Conclusion

As winter approaches, it's crucial to maintain and monitor your PV system to prevent performance dips caused by cold weather. With the right protective measures and operational strategies, you can ensure stable and reliable inverter operation, even during the harshest winter conditions. For further assistance or personalized advice, feel free to contact our support team at Solis. We're here to help you keep your solar system running smoothly all year round.



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