How to Charge and Maintain Your LFP Portable Power Station for a Longer Lifespan

You’ ve been planning your next camping expedition for months. You upgraded your gear, added an electric grill for home-cooked meals, and even purchased an Anker PowerHouse so all your devices stay charged outdoors.

On the morning of your trip, you load up your truck with all the camping gear that has laid stored away and unused for months. With everything set to go, you at last reach for your portable power station, only to discover... the battery is depleted!



So, what gives? Aren't LFP batteries meant to reliably serve you for years? And isn't an Anker PowerHouse "built to last"?

In order to find answers, we must first understand how the lithium iron phosphate batteries within a portable power station operate. Then, we can apply some best practices on how to properly maintain our portable power station, in order to avoid the above scenario and to prolong the device's lifespan.

Lithium Batteries Have a Self-Discharge

You're likely wondering why your portable power station loses its charge in the first place, even when it's not actively in use. This is in fact not a flaw or defect of the device, but rather a characteristic of all lithium-based batteries.

Lithium batteries will most often degrade due to three main reasons: time, charge cycles, and environment. With an awareness of these factors, you can better plan the use of your portable power so you won't face any unwanted surprises during a blackout – or when it's time for that camping trip. First, let's talk about time:

Lithium cells are susceptible to a phenomenon known as **self-discharge**, in which the battery will gradually discharge over time despite not being connected to or powering anything.

This rate of self-discharge is around 3% of capacity per month under typical environmental conditions. So if your portable power station is charged to 30% capacity, after 10 months it will be depleted if left untouched.



Most lithium-based batteries can face severe stability issues if fully depleted. Fortunately, the LiFePO4 batteries found in high-quality portable power stations are not prone to these issues; however, it is still recommended not to let your device reach 0% capacity.

LiFePO4 Batteries + Smart BMS = Longer Lifespan

Many of the concerns associated with lithium-ion batteries—such as lifespan, durability, and charge cycles—are alleviated with the use of lithium iron phosphate batteries. The advantages of LFP batteries are numerous: over 3,000 charge cycles versus the 500 of lithium-ion; greater stability and safety; and more flexibility with how they're charged and discharged. For a deeper understanding of the many benefits and characteristics of LiFePO4 batteries, check out our informative guide <link to LFP battery article> on the topic.

Additionally, portable power stations like the Anker PowerHouse are equipped with a **Battery Management System (BMS)** that helps regulate charging and temperature levels, as well as

enact certain failsafes to extend battery life. Of particular importance is in relation to voltage control, and how the system protects the battery from overcharging or over-discharging.



Avoiding an Overcharge or Over-discharge

The normal charging voltage of a LiFePO4 battery is 3.65V. That is, when the battery is most stressed during a recharge, its voltage should typically not exceed this number. Conversely, the normal discharging voltage (when the battery is actively powering a device) is 2.0V. If the cell's voltage somehow crosses a certain threshold beyond these numbers—either above 3.65V when charging or below 2.0V when discharging—then the battery can become damaged.

But don't worry! The BMS inside the Anker PowerHouse is embedded with an active protection function that works to prevent the voltage from crossing this threshold. If the battery ever gets near this voltage danger zone, then the protection function will automatically trigger and shut down the portable power station.

Beyond this failsafe are additional features designed to prolong a portable power station's lifespan. In a smart balance between convenience and stability, the battery will fast charge to 80% capacity, and then more slowly trickle charge to get to the final 100%. This allows you to quickly get the power you need, without overly stressing the battery.



Anker PowerHouse is also equipped with a unique feature called Power Saving Mode. When enabled with the switch, the BMS will cut off voltage to the output port as soon as a connected device is fully recharged. This minimizes wear and tear on the battery and prevents unnecessary voltage discharge.

The Best Ways to Maintain Your LFP Portable Power Station

All the information thus far relates to how your LFP portable power station is designed to operate – with little to no input from the user. But in order to maximize the lifespan of your device, there are some simple yet important guidelines you should follow to best maintain its batteries.

1. Turn Off All Outputs When Not in Use

Simple enough. When storing your portable power station, make sure it isn't switched on and its ports are not in active use.

You'll notice that the Anker PowerHouse has a button that engages the AC ports and one that engages the car outlet. These should be switched off when you're not using them, in order to reduce unnecessary power consumption.

Remember the Power Saving Mode button referred to above? Turn that to *on* as a reassurance that your battery is being conserved to its fullest.

2. Store in a Cool, Dry Environment

As previously mentioned, the environment has a critical impact on the lifespan of a portable power station. Although the Anker PowerHouse is durable and built to last, it is still an electronic device—so avoid getting it wet.

You should store it in an environment that is dry, well-ventilated, and away from direct sunlight. No moldy basements or uninsulated outdoor sheds. Don't store it in close proximity to a heat source, like a furnace or fireplace. Ideally, the humidity of the room should be regulated and kept between 35%–65%.



3. Store and Operate Within Optimal Temperatures

Temperature is a key factor of the environment, and it is perhaps the most important consideration when storing or using your portable power station.

While the BMS can monitor temperatures and react accordingly, it is best not to overly strain the system within an extremely cold or hot environment.

LiFePO4 batteries are more resilient than typical lithium-ion batteries, where they can withstand much greater temperatures by comparison. Whereas the optimal operating temperature of a Li-ion battery reaches a maximum of 25°C (77°F), LFP batteries can operate at up to 48°C (120°F) without degradation.



One thing to be aware of, however, is that LFP batteries do not like extreme cold. For utmost reliability and stability, keep them above freezing temperatures (0°C or 32°F). If you store a portable power station in the back of your vehicle for roadside emergencies, then you may want to relocate it in the winter months.

When storing your portable power station longterm, it is best to keep it in a stable environment that does not exceed a temperature range of 15°C to 35°C (59°F to 95°F).

4. Charge to 100% After Using

LiFePO4 batteries are once again at an advantage here, since they have a steady state of charge regardless of their current capacity level. Even so, it's a good practice to fully recharge your portable power station before storing it away.



Due to the self-discharge of lithium cells, we recommend storing your Anker PowerHouse at around 50% capacity or higher. Better yet, we suggest recharging it to 100% every 3 months so your battery remains at peak performance and condition.

5. Regularly Check Remaining Capacity

Finally, it's a good idea to routinely check in on the condition of your portable power station. If possible, check the capacity every week to ensure the battery is healthy and adequately charged. This will keep you ready and prepared when you need it, since you never know when that next power outage could occur...

The Longest-Lasting Power

Thanks to its durability, premium components, and advanced BMS, the Anker PowerHouse is designed to last for over 10 years of everyday use. And with proper care, you can enjoy this long-lasting experience to the fullest.

By following this suggested guide, you'll get the most life out of your PowerHouse and be able to utilize reliable power whenever you need it for the next decade—and beyond!