

Will Battery Backups work for your CPAP and other small electrical devices?



You can buy a 300-500 Wh battery packs that have AC outputs that are sold as emergency battery packs for CPAP and other machines. They cost around \$250-600. Do they work? **Well, we can't recommend them at this point because of their limitations.**

The packs are very low-power with limited capacity — so a gasoline generator may be better if you expect power to be off for several days or you have larger power needs, such as refrigeration.

The key number you are looking for is “Watt-hours” often abbreviated “Wh” - this is how much power you have. You can take the number of watts your device uses and divide the total Wh by that to get an estimate of how many hours you can run your device. Most of the affordable ones are 300-500 Wh.

Many CPAPs without heaters use 50 Watts, so if your pack is 300 Watt-hours, it means 300 Watt-hours ÷ 50 Watts = 6 hours. In reality, there are some inefficiencies and advertising fluttery so you may only get 5 hours. A 500 Wh or larger could last all night. Note that if you can skip the AC inverter and plug your CPAP/BPAP directly to the DC-output, you will get more battery life. Not all battery packs support this, not all CPAP machines support this, and plugging in the wrong voltage or polarity can damage your equipment - use with caution!

How many hours will it run with a 300 Wh pack?

Mini-refrigerator	1500 watts surge	Cannot use
O2 concentrator (large)	600 watts	Cannot use
O2 concentrator (small)	120 watts	2 hours
Wheelchair or scooter charger	300 watts	1 hour (will barely add any charge)
CPAP (with heater)	90 watts	3 hours
CPAP (no heater)	50 watts	6 hours
Laptop	50 watts	6 hours or 1-2 charges
LED Lightbulb	15 watts	20 hours
Tablet	15 watts	20 hours
SmartPhone	10 watts	30 hours

How would I charge it?

You'll need to charge these devices each day (they don't generate their own power). So you will need to go somewhere that has AC power and charge it. Some will charge off of your car DC power outlet (aka cigarette lighter).

Note that many models charge at approximately 60 watts - that means it would take 5 hours to fully charge at 300 Wh one. A large GoalZero 1000 Wh battery takes 18 hours to charge up from an AC outlet - and 20-40 hours of direct sun to charge via their 100 Watt solar panel!

What about solar charging?

The UC Berkeley Disability Lab tested a "60 watt" solar panel that was sold alongside these devices for \$150 and the solar panel supplied only 20-30 watts in full Berkeley sun. That means it would take 10-15 hours to fully charge a 300Wh pack. This clearly won't work if you expect to use it for power each night.



Are these packs useless?

If you understand their limitations, they have their uses. You can use them for emergency backup power for a limited amount of time to charge your phone or tablet. If you know you'll have power at an alternate location, you could recharge them every day. But because they don't generate their own power and solar panels are too weak for NorCal sun, we don't recommend them for emergency purposes during outages that last more than one day.

Please give us feedback on this! Either now or later on at: knak@berkeley.edu. v0.1c