

HOW BIG A PORTABLE POWER STATION DO YOU NEED?

List what you need to run, then add two numbers: the watts of everything running at once (the station's output rating must cover it) and the watt-hours used per day (its capacity must cover that, times the days between recharges). For a medical device, ask the device maker first.

Reviewed October 30, 2026

A portable power station is a rechargeable battery with built-in outlets: AC plugs like a wall socket, plus USB and often a 12-volt car-style port. Ready.gov tells households to “plan for batteries and other alternative power sources to meet your needs when the power goes out.” This page shows how to work out what size you need, with the math done step by step.

All numbers in the worked example below are **example numbers** chosen to make the arithmetic easy. They are not measurements of any product or device. Use the figures printed on your own devices and in your own manuals.

WATTS VS. WATT-HOURS

Two numbers on a power station's label answer two different questions.

- **Watts (W)** are power: how much a device draws at a given moment. The U.S. Energy Information Administration (EIA) explains that electricity is measured in units of power called watts, and one kilowatt is 1,000 watts. A power station's **output rating** in watts is the most it can deliver at once.
- **Watt-hours (Wh)** are energy: power used over time. EIA defines one watt-hour as “the energy of one Watt used for one hour.” A power station's **capacity** in watt-hours is how much energy it stores.

EIA's own example: a 40-watt light bulb used for five hours uses 200 Wh, or 0.2 kWh.

So the output rating decides *what* you can plug in at the same time, and the capacity decides *how long* it runs.

STEP 1: LIST WHAT YOU NEED TO POWER

Start with the short list, not the whole house. In an outage, the usual priorities are light, phones, a radio for news, and any medical device. Ready.gov's kit list includes a “cell phone with chargers and a

backup battery” and a battery-powered or hand crank radio (Ready.gov).

For each item, find its wattage on the label, the power adapter, or the manual. Then estimate how many hours a day you would run it.

STEP 2: ADD UP THE WATTS RUNNING AT ONCE

Add the watts of everything that might run at the same moment. The power station’s continuous output rating has to be higher than that total.

Many power stations list two output figures: a continuous rating and a higher surge or peak rating. Check both against what your devices’ labels and manuals say they need.

STEP 3: ADD UP THE WATT-HOURS PER DAY

For each item, multiply its watts by its hours of use per day. Add the results. That is your daily energy need in watt-hours.

Worked example (example numbers only)

ITEM (EXAMPLE)	WATTS	HOURS PER DAY	WATT-HOURS PER DAY
LED lamp	10	5	50
Phone charging (two phones)	15 each	2 each	60
Radio	5	6	30
A medical device rated at 50 W	50	8	400
Total	95 if all run at once		540

In this example:

- **Output rating:** if everything ran at the same time, the station would need a continuous output above 95 W.
- **Capacity for one day:** 540 Wh.
- **Capacity for three days with no recharging:** $540 \times 3 = 1,620$ Wh.

Check the manual for usable capacity or runtime figures rather than relying on the number on the box alone. If the manual does not give them, leave a cushion. Adding 25 percent here, as a planning choice and not a measured figure, gives $1,620 \times 1.25 = 2,025$ Wh for three days.

To run the same math on your own list, use the worksheet below.

POWER NEEDS WORKSHEET

Enter each device's watts from its label, adapter, or manual, the hours a day you would run it, and how many you have. One watt-hour is "the energy of one Watt used for one hour" (EIA), so watts times hours gives watt-hours. *Example numbers:* a 10 W lamp for 5 hours and a 5 W radio for 6 hours make $50 + 30 = 80$ Wh a day. Everything stays on this page; nothing is saved or sent.

DEVICES

	DEVICE (optional)	WATTS	HOURS A DAY	QTY
1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="1"/>
2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="1"/>

ASSUMPTIONS

DAYS BETWEEN CHARGES

How long the station must last before you can recharge it. Up to 365.

USABLE SHARE OF RATED CAPACITY (%)

The share of the station's rated (nameplate) watt-hours you expect to get out as usable energy. Use your station's manual if it gives a figure. 100 means no adjustment. The 25 percent cushion in the worked example is the same as entering 80.

This is arithmetic, not a test of any product. It does not show whether a given power station will run a given device: it leaves out surge (startup) draw, which outlets and ports the station has, and how fast or reliably you can recharge it. Check the station's manual and each device's label.

Medical devices: FDA (<https://www.fda.gov/medical-devices/emergency-situations-medical-devices/fda-offers-tips-about-medical-devices-and-natural-disasters>) advises you to "read your user instructions or call your distributor or device manufacturer" to learn if your device can be used with batteries or a generator. These numbers are not a runtime promise for any medical or life-sustaining device.

If the number is bigger than you expected, cut the list or plan to recharge every day. The next section covers how.

STEP 4: PLAN HOW YOU WILL RECHARGE IT

A power station is only as useful as your ability to refill it. Plan at least one way to recharge that does not depend on the grid.

- **Wall outlet.** Keep it charged before storm season and top it up whenever power returns, even briefly. Ready.gov's advice for medical and assistive device batteries applies here too: "keep extra batteries charged at all times" (Ready.gov).
- **Solar panels.** Output depends on sun, clouds, and panel angle, so estimate on the low side. To estimate, multiply the average watts you expect by hours of usable daylight. *Example numbers:* a panel averaging 50 W over 6 hours puts back 300 Wh, which would not cover the 540 Wh example day by itself.
- **Car charging.** Many stations can recharge from a vehicle's 12-volt outlet. If you run the engine to do it, never run it in a garage or other enclosed space. FDA warns never to run a motor vehicle, generator, or any gasoline-powered engine inside a basement or garage, or outside an open window or door where exhaust could get in.
- **Generator.** If you also own a generator, it can recharge the station outdoors. Follow the placement rules in generator safety.

USING A POWER STATION FOR MEDICAL DEVICES

If anyone in your home depends on a powered medical device, talk to the device maker and your provider before you buy anything.

FDA advises reading your user instructions or calling your distributor or device manufacturer to find out whether the device can run on batteries or a generator. Ask the same question about the specific power station you plan to use, and ask how much power the device draws in the settings you actually use.

FDA also says:

- Check for water before plugging in your device, and do not plug in a power cord if the cord or the device is wet.
- When the power is restored, check that the settings on your medical device have not changed.
- When oxygen is in use, use battery-powered flashlights or lanterns, not gas lights or torches.

Ready.gov recommends talking to your doctor or health care provider about how to keep medical equipment running during an outage, and buying an extra battery for a power wheelchair or other battery-operated medical or assistive device. For the full plan, see medical needs in an outage.

■ WARNING

A power station is not a substitute for a plan for a life-sustaining device. Confirm with the device maker and your provider how long the device can run on backup power, and know where you will go if the power station runs down.

INDOOR USE AND CARBON MONOXIDE

Portable gasoline generators produce carbon monoxide (CO), an odorless, colorless gas that “kills without warning” (CDC). CPSC says never to operate a portable generator inside a home, garage, basement, crawlspace, shed, or other enclosed space, and that opening doors or windows will not provide enough ventilation.

A battery power station has no engine and burns no fuel. The CDC and CPSC carbon monoxide warnings above are written about generators, gasoline engines, charcoal, and other fuel-burning devices. Follow your power station’s manual for where to use, charge, and store it.

Keep CO alarms working regardless. Ready.gov says generators, camp stoves, and charcoal grills should always be used outdoors. CPSC says to install battery-operated alarms or alarms with battery backup on each level of the home and outside separate sleeping areas, and to test them monthly.

BATTERY FIRE SAFETY AND RECALLS

Power stations hold large lithium-ion batteries. CPSC has recalled power stations for fire hazards; in one 2024 recall it said the lithium-ion batteries “can overheat” and urged owners to stop using the units immediately (CPSC).

- Search CPSC recalls for your model before you buy and from time to time after.
- Follow the manual’s instructions for charging and storage.
- Keep working smoke alarms. CPSC says to install them on every level of your home and inside each bedroom.

SIZING CHECKLIST

BEFORE YOU BUY

- ☐ List the devices you need in an outage, starting with light, phones, a radio, and medical equipment
- ☐ Write down each device's watts from its label, adapter, or manual
- ☐ Add the watts of everything that could run at once
- ☐ Multiply each device's watts by hours per day and add them up
- ☐ Multiply the daily watt-hours by the days between recharges
- ☐ Ask the medical device maker whether the device can run on the power station you plan to use

RECHARGING PLAN

- ☐ Keep the power station charged before storm season
- ☐ Pick at least one recharge method that does not need the grid
- ☐ Charge from a car only with the vehicle outdoors, never in a garage
- ☐ Run any generator outdoors only, per the generator safety rules

SAFETY

- ☐ Search CPSC recalls for your model
- ☐ Battery-operated or battery-backup CO alarm on each level
- ☐ Smoke alarms on every level and in each bedroom
- ☐ Follow the manual for indoor use, charging, and storage

For item types to keep on hand, see home backup power. For the day-by-day plan, see what to do when the power goes out.

TRACK

Power outage

SHEET 6 of 9

REVIEWED October 30, 2026

COMPILED FROM THESE SOURCES

- 1.** U.S. Energy Information Administration, Measuring Electricity
- 2.** Ready.gov, Power Outages
- 3.** Ready.gov, People with Disabilities
- 4.** Ready.gov, Build a Kit
- 5.** FDA, FDA Offers Tips about Medical Devices and Natural Disasters
- 6.** CDC, Generator Safety Fact Sheet
- 7.** CPSC, Winter Storm May Knock Out Power; CPSC Warns of Deadly Carbon Monoxide and Fire Risks (2026)
- 8.** CPSC, Recalls and Product Safety Warnings
- 9.** CPSC, HALO 1000 Portable Power Stations Recalled Due to Serious Fire and Burn Hazards

Every safety claim on this sheet links to its primary source.