



An Extended Guide · No. 1598

Watts vs. Watt-Hours: Sizing a Battery or Power Station

How much at once,
and how long it lasts

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! Read this first — size for safety, not just comfort

Getting the size right is not only about comfort — it is about safety, too. An undersized unit gets overloaded and pushed harder than it should be: it runs hot, it strains, and a motor that can't get the surge it needs can hum, overheat, and be damaged. So take the size seriously and always leave yourself a margin — a little extra room — rather than sizing right to the edge. And one safety rule never changes: any fuel-burning generator gives off carbon monoxide, an invisible, deadly gas, so it runs **OUTDOORS ONLY**, well away from the house (the safety agencies say at least 20 feet), never in a garage or on a porch even with the door open. A battery or power station makes no exhaust and is safe to use indoors. Because this guide is about batteries and power stations, the good news runs right through it: a battery burns no fuel, so it makes no exhaust and is safe to use indoors.

Two numbers a battery lives by

A battery or power station has two numbers that do completely different jobs — watts and watt-hours. Mix them up and you can end up with a unit that won't run what you need, or won't last as long as you hoped. Keep them straight and choosing gets simple.

I'm Bill. When folks tell me a power station 'has plenty of power' but died before morning, or wouldn't start the fridge at all, this is nearly always why. Those are two separate questions — how much at once, and how long — and a battery answers them with two separate numbers.

We'll take them one at a time: first watts (how much it can hand out at any moment), then watt-hours (how much energy it holds), and then how they work together. No math degree, and nothing you have to memorize.

★ Not sure which number you're short on?

Tell me what you'd want to run and for how long, and call or text me at (330) 200-8042. I'll help you tell the two numbers apart for your own gear — free, with nothing to sell you.

The whole idea, on one page

If you remember only this page, you already understand the thing most battery shoppers miss.

- ❑ Watts = how much power it can deliver at once. This decides whether it can run a thing at all.
- ❑ Watt-hours = how much energy it stores. This decides how long it lasts.
- ❑ A battery also has a brief surge (or 'peak') watt rating above its steady one, for starting motors.
- ❑ The two numbers are independent: plenty of one doesn't make up for too little of the other.
- ❑ Roughly, watt-hours divided by your load in watts is about how many hours you'll get, minus some loss.
- ❑ Expansion batteries add watt-hours (more hours), not watts (more power).

✓ Two questions, every time

For any battery, ask both: can it run everything at once (watts?), and can it run it long enough (watt-hours?). You size for both, not one.

Power and energy are not the same thing

The whole guide rests on one everyday distinction, and you already know it from other parts of life.

Think of a garden hose. How wide the hose is decides how much water it can push at once — that's like watts, the power. How big the tank feeding it is decides how long it can keep flowing — that's like watt-hours, the energy. A fat hose on a tiny tank empties fast; a big tank on a pinched hose can't push much through at a time.

A battery is the same. Its watts tell you how much it can hand out in any given moment, and its watt-hours tell you how long it can keep doing it. You need enough of each — a big number in one column can't rescue a small number in the other.

✓ Watts is 'how much,' watt-hours is 'how long'

If you carry away one line, carry this one. Watts answers whether it can run your gear; watt-hours answers whether it can run it through the night.

Watts — how much it can deliver at once

This is the number that decides whether a battery can run a thing at all, this very second.

Add up the running watts of everything you'd have plugged in at the same time. A battery's steady watt rating has to clear that total — if your gear asks for more power than the battery can push, it simply can't run it all at once, no matter how much energy is stored inside.

And motors need more than their steady draw for a second or two when they start. So the battery's power has to cover your running total plus the biggest single surge on top. That's the very same running-plus-biggest-surge thinking from our running-watts-versus-starting-watts guide, just aimed at a battery's watt rating instead of a generator's.

✓ Watts is a gate, not a fuel gauge

Think of the watt rating as a doorway: your load either fits through it or it doesn't. How long you can keep the lights on once you're through is a different number entirely.

Two watt numbers: continuous and surge

Just like a generator, a battery usually advertises two watt figures, and they mean different things.

The **continuous** (or 'rated') watts is what the battery can hand out steadily, minute after minute — the number your running total has to fit under. The **surge** (or 'peak') watts is a brief, higher burst it can deliver for a moment, to help a motor jump to life.

So a battery has to clear your steady total with its continuous rating, and clear your biggest motor's jolt with its surge rating. If a unit lists only one big watt number, look for the smaller continuous figure nearby — that's the honest one for steady work.

! The big bold watt number is often the peak

As with generators, marketing loves the largest figure, which is usually the brief surge. Size your steady loads to the continuous rating, and treat any single giant number with a little suspicion.

Watt-hours — how much energy it stores

This is the number that decides how long the battery keeps going before it needs a recharge.

Watt-hours are the size of the tank. A bigger watt-hour number means more stored energy, which means more hours of running your gear before the battery is empty. It says nothing about how much the battery can push at once — only about how long it can keep pushing.

This is the number folks forget when they're focused on whether a unit can run the fridge. It can run the fridge just fine on its watts — and still run flat before breakfast if its watt-hours are small. How long matters as much as how much.

✓ Watt-hours is the size of the tank

More watt-hours is more runtime, plain and simple. When you picture two batteries with the same watts but different watt-hours, the bigger-tank one just lasts longer.

A rough sense of how long it will last

You don't need exact numbers to get the idea of runtime — just the shape of the arithmetic.

Roughly, the watt-hours divided by the watts your gear is drawing tells you about how many hours you'll get — minus a little, because no battery hands out every last bit of its energy without some loss along the way. The lighter your load, the more hours you stretch out of the same tank; the heavier the load, the faster it drains.

That's why the same power station might run a couple of small electronics for a long stretch but a hungry appliance for far less time. Our guide on runtime and fuel goes deeper on planning for how long an outage might last, and adding a reserve on top.

✓ Lighter loads run longer

If you want more hours out of a battery, the surest lever is running less at a time — fewer things on, and the hungry ones only when you need them.

Why the two numbers don't rescue each other

Here's the trap, stated plainly: a big number in one column can't cover a small number in the other.

- **Plenty of watt-hours, too few watts:** a big tank, but it can't push hard enough to start a big motor. It just won't run it.
- **Plenty of watts, too few watt-hours:** it runs everything fine, then goes flat long before the outage is over.
- **Enough of both:** the only combination that actually keeps your gear running as long as you need.

So you always check both. First: do the watts clear my running total plus the biggest surge? Then: do the watt-hours cover the hours I need? A unit has to pass both tests, not just the one that's printed largest on the box.

! One good number is not enough

The most common battery disappointment is buying for one number and ignoring the other — a unit that starts everything but dies early, or one that lasts for days but can't run the fridge. Check both before you buy.

Finding both numbers on a power station

Every battery and power station lists both numbers — once you know what you're looking at, the spec sheet gets easy to read.

Look for a watt figure (often two — a continuous one and a higher surge or peak one) and, separately, a watt-hour figure. The watts are usually front and center; the watt-hours may be labeled 'capacity' or 'energy.' If you see amp-hours instead, that's a related energy measure — ask the maker to give you the watt-hours so you're comparing like with like.

Compare units on both numbers at once. A slightly smaller watt rating may be fine if it still clears your list; a small watt-hour number is what leaves you in the dark early. Read them the way you'd read a nameplate — carefully, and without trusting the biggest bold figure.

★ Send me the two numbers

If a spec sheet is a jumble of watts, watt-hours, and amp-hours, snap it and text it to me at (330) 200-8042. I'll help you find the two numbers that matter and see whether they clear your list — free.

Expansion batteries add hours, not power

Many power stations let you plug in extra batteries. It's worth knowing exactly what that buys you.

An expansion battery adds watt-hours — a bigger tank, more hours of runtime. What it usually does not do is raise the watts, the power the unit can push at once. So bolting on more batteries helps a unit last longer, but it generally won't let it start a motor it couldn't start before.

That's a useful thing to know before you spend. If your problem is 'it doesn't last long enough,' expansion batteries are the answer. If your problem is 'it won't run the thing at all,' you need more watts — a bigger unit or a different tool — not more watt-hours.

✓ Match the fix to the problem

Short on hours? Add watt-hours. Short on power? You need more watts. Naming which one you're short on saves you from buying the wrong add-on.

Two kinds of homes, two sets of needs

A battery fits a town home and a rural one very differently — and out on a well, there's one job a battery usually can't do at all.

If you live in town or the suburbs

In town or the suburbs, a battery or power station is often a lovely fit. Your must-run list tends to be small, steady, and battery-friendly — and with city water, there's no big pump to start, so watts rarely become the sticking point.

- A battery can quietly carry the fridge, the internet, a CPAP, and a few lights overnight — indoors, no exhaust.
- Size the watts to run those at once, and the watt-hours to last through the night.
- Clean battery power is gentle on sensitive electronics and medical gear.
- If you want more hours, add watt-hours or plan to recharge during the day.

If you are out in the country on a well

Out on a well, a battery runs into a wall: a 240-volt well pump needs far more power to start than a typical power station can push. Its watts are simply too low, so no amount of watt-hours will start that pump.

- A battery usually cannot start a 240-volt well pump — the watts fall short, not the watt-hours.
- So let a battery handle the small, steady loads, and let a generator handle the pump's big surge.
- Many rural homes combine the two: a generator for water and heat, a quiet battery for overnight essentials.
- Get the pump's real figures from its nameplate or well company; see our well-pump sizing guide for the surge.

★ On a well, plan the battery and the pump separately

The well pump is the one load a battery usually can't touch, and that's worth planning around, not fighting. Tell me your loads and your pump, and I'll help you split the job between a battery and a generator. Call (330) 200-8042.

Recharging is the other half of 'how long'

Watt-hours tell you how long one charge lasts — but a battery you can refill mid-outage effectively lasts much longer.

Most power stations recharge from a wall outlet when the power's on, and many also take solar panels or a car adapter. If you can top the battery back up — from the sun by day, from your car, or during a brief return of grid power — its watt-hours stretch across a far longer outage than a single charge would suggest.

How fast it recharges, and from what sources, is really a choosing-the-unit question rather than a sizing one. Our power-station guides cover recharge options, and our guide on runtime and fuel covers planning for how long you'll actually need to keep going.

✓ A rechargeable tank behaves like a bigger one

Solar by day or a quick car charge can turn an overnight battery into a multi-day one. When you plan for how long, count the refills, not just the first charge.

What a battery does beautifully — and what it doesn't

Batteries have real strengths and real limits. Playing to the strengths is how you get your money's worth.

- **Great at:** small, steady loads — phones, lights, the internet box, a CPAP, a laptop.
- **Great at:** clean, quiet, indoor power with no fuel, no exhaust, and no noise.
- **Often fine for:** a fridge overnight, if the watts clear it and the watt-hours last.
- **Not great at:** big motors and long, heavy runs — especially a 240-volt well pump.
- **Not great at:** powering a whole house for days on a single charge with no way to refill.

✓ Right tool, right job

A battery isn't a small generator or a large one — it's its own tool, best at quiet, steady, indoor loads. Match it to those and it's hard to beat.

When a battery is the wrong tool for the job

It's kinder to know a battery's limits up front than to discover them in the dark.

The clearest case is a 240-volt well pump. Its starting surge runs into the thousands of watts, well beyond what a typical power station can push — so it's a watts problem, and adding watt-hours won't fix it. The same caution applies to central air, an electric range, or an electric water heater: big, hungry loads that ask for more power than most batteries deliver.

There's no shame in a battery that can't do these — that's what generators are for. The mistake is expecting one unit to do everything. Name the loads a battery can't handle, and you'll know exactly where a generator has to step in.

! Don't force a big motor onto a small battery

Asking a battery to start a motor it can't power just trips its overload protection — and repeatedly forcing it is hard on the gear. If the watts fall short, it's the wrong tool for that load, full stop.

Battery and generator, working as a team

For many homes, the best answer isn't one or the other — it's both, each doing what it does best.

A generator handles the big, occasional jobs: starting the well pump, running the furnace blower, carrying central air — and, while it's running, it can recharge the battery. The battery then carries the quiet overnight loads — the CPAP, the internet, a few lights — indoors, silently, so the generator isn't running (and burning fuel) all night for a small load.

That pairing lets each unit stay modestly sized. The generator only has to cover the heavy loads, and the battery only has to cover the light ones. Our guide on managing loads during a run and our runtime and fuel guide both lean on this take-turns idea.

★ Let's plan the team

If a battery-plus-generator setup sounds right for your home, I can help you size each piece to its share of the work. Call or text me at (330) 200-8042 and we'll map it out together.

Clean power for the gear that's fussy about it

Some of what you'd run on a battery cares not just about how much power, but how clean it is.

Medical devices, computers, and modern electronics prefer smooth, steady power. A battery or power station delivers exactly that kind of clean output, which makes it a natural fit for a CPAP, a home office, or the internet gear — and quiet enough to sit right in the bedroom or at the desk.

If any of your loads are medical, please treat backup power as one layer of a plan you make with your equipment supplier and doctor — our guide on sizing for medical devices covers that carefully. And our home-office-and-internet guide covers keeping the desk and the connection up during an outage.

✓ Quiet, clean, and indoors

The very things that make a battery limited for big motors — modest power, no engine — make it ideal for sensitive, steady gear you want running quietly beside you.

A quick self-check before you buy

Run these questions and you'll know whether a battery fits your list — and which number to watch.

- ☐ Do the continuous watts clear everything I'd run at once?
- ☐ Does the surge watt rating cover my biggest motor's jolt?
- ☐ Are there enough watt-hours to last the hours I need?
- ☐ Can I recharge it during a longer outage — wall, solar, or car?
- ☐ Is there a load here (like a 240-volt pump) a battery just can't do?

✓ If any answer is 'not sure', that's fine

That's exactly what the spec sheet, the worksheet guide, and a quick call with me are for. Call or text (330) 200-8042 and we'll check both numbers against your list.

Common mistakes with watts and watt-hours

Almost all battery regret traces back to a few mix-ups. Now you'll see them coming.

- **Buying on watt-hours alone**, then finding it can't start a motor it doesn't have the watts for.
- **Buying on watts alone**, then watching it go flat hours before the power comes back.
- **Trusting the big bold watt number**, which is usually the brief surge, not the steady rating.
- **Expecting expansion batteries to add power** — they add hours, not watts.
- **Counting on a battery for a 240-volt well pump**, which almost always needs a generator instead.

! Check both numbers, every time

The single habit that prevents nearly all of these: before you buy, ask whether the watts run your list and whether the watt-hours last long enough. Both, not either.

Questions worth asking before you buy

Whether you're talking to a salesperson or to me, these get you to the truth about the two numbers.

Q: Is this a continuous watt rating or a surge rating?

Ask which one a quoted watt figure is. You want the continuous (or 'rated') watts for your steady total, and a separate, larger surge figure for motors.

Q: How many watt-hours does it store?

This is the runtime number. If the spec only lists amp-hours, ask for the watt-hours so you can compare units fairly and estimate hours.

Q: Will it start my biggest motor, not just run small stuff?

Match its surge watts to your biggest motor's jolt. For a 240-volt well pump, the honest answer is usually no — that's a generator's job.

Q: Can I add batteries later, and what will that get me?

Often yes — and it adds watt-hours (more hours), not watts (more power). Handy if you expect longer outages down the road.

✓ There's no silly question

If watts and watt-hours still feel slippery, that's normal — call or text me at (330) 200-8042 and we'll sort them out together.

Common Questions

The battery-sizing questions I hear most, answered plainly.

Q: What's the difference between watts and watt-hours?

Watts is how much power a battery can deliver at once — it decides whether it can run a thing. Watt-hours is how much energy it stores — it decides how long it lasts. You size for both.

Q: Can a power station run my whole house?

For small, steady loads, often yes for a while. For big motors like a 240-volt well pump or central air, usually not — the watts fall short, and that's a job for a generator.

Q: Will more watt-hours help it start my fridge?

No — starting the fridge is a watts question, not a watt-hours one. More watt-hours make it last longer, but won't add the power to start a motor it couldn't before.

Q: Is a battery safe to run indoors?

Yes. A battery or power station burns no fuel and makes no carbon monoxide, so it's safe indoors — one of its biggest advantages over a fuel-burning generator.

★ Still weighing the two numbers?

Send me your list and the unit's spec sheet at (330) 200-8042 and we'll check the watts and the watt-hours against what you actually want to run.

Bringing it all together

You now hold the distinction that makes battery shopping simple: watts is how much at once, watt-hours is how long — and you size for both.

Check that the continuous watts clear your running total, the surge watts cover your biggest motor, and the watt-hours last the hours you need. Remember that expansion batteries buy hours, not power, and that a 240-volt well pump usually belongs to a generator, not a battery.

From here, our running-watts-versus-starting-watts guide explains the power side, our runtime and fuel guide explains the how-long side, and the power-station guides help you match your two numbers to the right unit.

★ Let's check both numbers together

If you'd rather talk it through than puzzle it out on a spec sheet, that's exactly what I'm here for. Call or text me at (330) 200-8042 with your list, and we'll make calm sense of it — free, with nothing to sell you.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made sizing a battery or power station feel a little less daunting and a lot more doable. Keep it in a drawer with your other home papers, come back to a page whenever you need it, and don't worry about memorizing anything.

When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day, come-back-free guarantee. I don't do the licensed electrical or gas work myself — for that I'll help you line up a trustworthy local pro.

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Watts vs. Watt-Hours

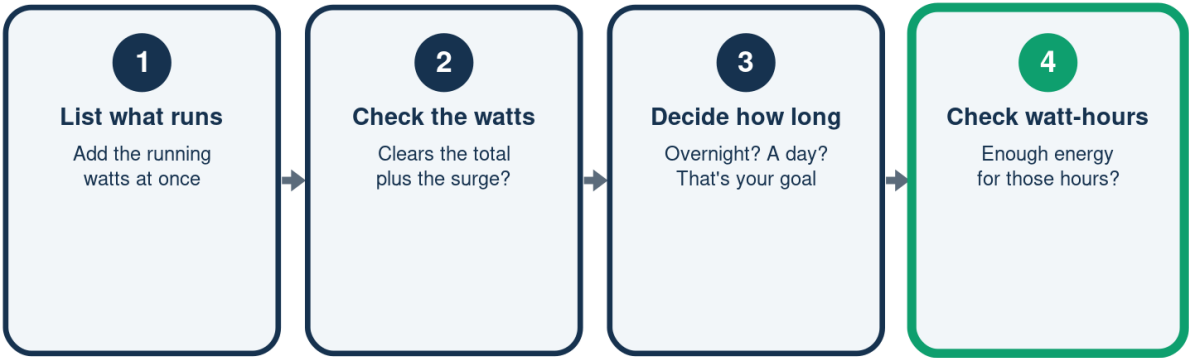
Two numbers a battery lives by

	What it means	What it decides
Watts	Power at once	Can it run it?
Watt-hours	Energy stored	How long?
Continuous	Steady output	Your running total
Surge / peak	A brief burst	The motor jolt

Watts is how much at once; watt-hours is how long it lasts.

Sizing a Battery in Two Checks

How much at once, and how long



Enough watts to run it, and enough watt-hours to last -- both.

What a Battery Is (and Isn't) For

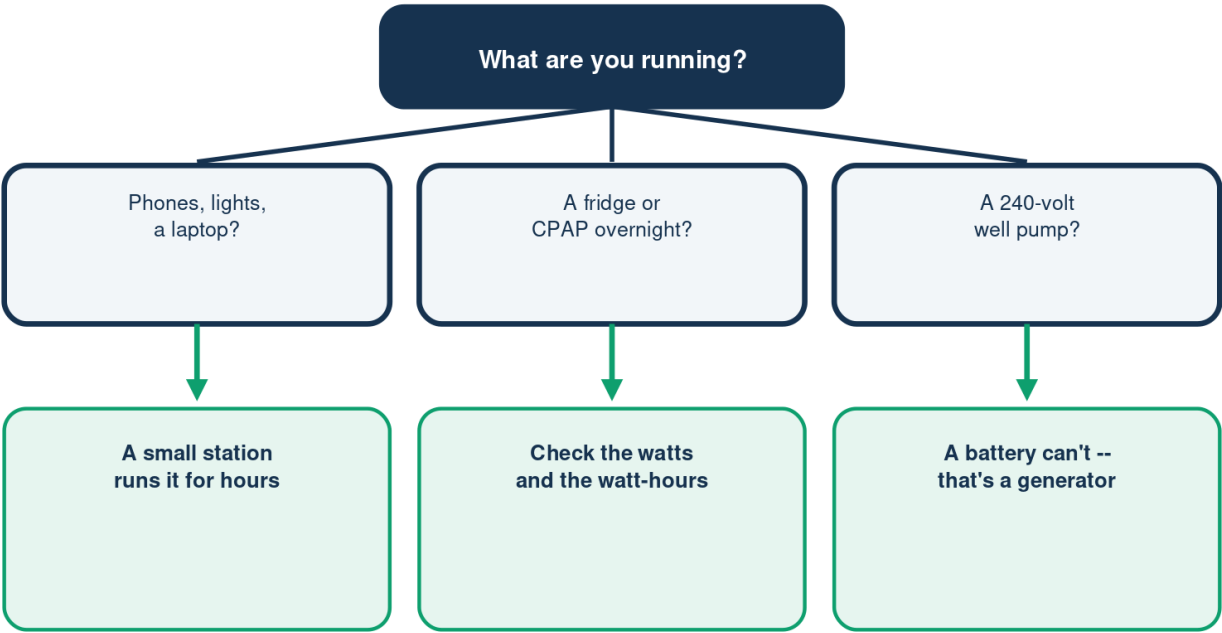
Play to its strengths

	Good fit?	Because
Phones, lights	Great	Small, steady
CPAP, internet	Great	Clean, quiet power
Fridge overnight	Often yes	If watt-hours fit
240-volt pump	No	Watts too low
Days-long outage	Limited	Runs out; recharge

Batteries shine at small, steady loads -- less so at big motors.

What Are You Running on a Battery?

Let the load point to the right tool



A battery's watts are usually too low to start a big 240-volt pump, no matter its watt-hours.

Illustration - a schematic, not to scale. Your setup may differ.



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A Note From Bill

A quick note from Bill.

I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that comes from using these guides. Thanks for reading, and stay safe out there.

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