



An Extended Guide · No. 1323

Sizing a Transfer Switch to Your Generator

Making the numbers agree

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! Read this first — panel work is a licensed electrician's job

A transfer switch connects to your home's electrical panel, and panel work is among the most dangerous jobs in any house. The power inside a panel can injure or kill even with the lights off, and a wiring mistake can start a fire or push deadly voltage back onto the lines outside, where a utility crew may be working. Installing, moving, or changing a transfer switch is a licensed electrician's job — almost always with a permit and an inspection. It is never a do-it-yourself project, and it is never something I do myself. This guide is here to help you understand, choose, and safely use a transfer switch — not to wire one. And please, never try to shortcut all this by backfeeding a generator through a wall or dryer outlet with a double-ended cord; that shortcut kills people, and a transfer switch is the safe, legal way to do the very thing it tempts you to do. Your electrician does the final sizing and wiring; this guide just helps you understand the idea so you don't end up overloaded.

Making the switch, generator, and your needs agree

Sizing simply means making sure three things agree: your must-run list, your generator's capacity, and the transfer switch. Get them to match, and outages are smooth. Get them mismatched, and you'll trip and overload things at the worst time.

I'm Bill. I'm going to teach you the idea behind sizing in plain English — no math homework, and I won't make up any numbers, because every generator and appliance is different. What I'll give you is a way of thinking that lets you read your own equipment's labels and talk confidently with an electrician.

The electrician does the final sizing and the wiring. But when you understand the idea, you can build a realistic list, choose a generator that fits, and avoid the number-one frustration folks have: asking a generator for more than it can give.

★ Want help sizing yours?

Send me your generator's nameplate or manual and your must-run list, and I'll help you see whether they match — with real numbers from your own gear, not guesses. Call or text (330) 200-8042.

Sizing, on one page

If you remember only these ideas, you understand sizing.

- ❑ Running watts are the steady power a thing uses; starting watts are a brief jolt to get motors going.
- ❑ Add up the running watts of everything you'd run at once, then add the single biggest starting surge.
- ❑ Leave headroom — don't plan to run a generator flat-out all the time.
- ❑ That total has to fit within your generator's capacity, printed on its nameplate.
- ❑ Motors surge (fridge, freezer, furnace blower, well and sump pumps); lights and heaters don't.
- ❑ The switch and cord must match your generator's outlet — your electrician confirms all of it.

✓ The switch doesn't add power

Remember: the transfer switch only routes power. Sizing is really about your generator versus your list — the switch just has to keep up.

Running watts and starting watts

This one idea explains most of what surprises people about generators.

Running watts (sometimes called rated watts) are the steady amount of power something uses while it's on. Starting watts (or surge watts) are a brief, much larger gulp of power that motors need for a second or two to get spinning. A refrigerator or a pump might sip modestly once it's running, but demand several times that for the instant it starts.

That surge is why a generator that seems 'big enough' on paper can still stumble when the fridge and the furnace both kick on at once. Sizing accounts for both the steady load and that starting jolt.

✓ The jolt is the tricky part

Steady power is easy to plan for. It's the brief starting surge — especially several motors starting together — that trips up an undersized setup.

Reading the nameplate

You don't have to guess any numbers — your appliances and generator tell you, if you know where to look.

Most appliances have a small metal or printed label — the nameplate — listing their electrical needs. Sometimes it gives watts directly. Often it gives volts and amps, and you can get a rough wattage by multiplying them (watts is roughly volts times amps). Your generator has a nameplate too, listing its running and starting watts — that's its capacity.

Gather those labels, or snap photos of them, and you've got real numbers to work with instead of internet guesses. If a nameplate is hard to find or read, that's a great thing to ask me or the electrician about.

✓ Photos make it easy

Take clear photos of each nameplate with your phone. It saves crawling behind the fridge twice, and it's easy to share with an electrician or with me.

What surges, and what doesn't

Knowing which of your things surge tells you where the sizing pressure comes from.

- **These surge (they have motors):** refrigerator, freezer, furnace blower, well pump, sump pump, air conditioner, power tools.
- **These don't surge (steady loads):** lights, a space heater, a kettle, a coffee maker, a television, phone chargers.
- **The big surgers** are usually the pumps and the compressors — they need the largest starting jolt.
- **The quiet ones** you can add fairly freely, as long as the steady total still fits.

When you size, the single biggest surge — often a pump or compressor — matters most, because it's the peak your generator has to survive.

✓ Find your biggest surger

Identify the one motor with the largest starting surge — often a well pump. That single item shapes a lot of your sizing.

The sizing recipe

Here's the whole method in one place. No numbers from me — just the steps you fill in with your own.

- ❑ Add up the running watts of everything you'd have on at the same time.
- ❑ Add the single largest starting surge among those items (not all surges — just the biggest).
- ❑ Compare that total to your generator's starting-watts capacity.
- ❑ Leave headroom — aim to stay comfortably below the maximum, not right at it.
- ❑ If the total is too high, trim the list or stagger what runs together.

That's it. The reason we add only the single biggest surge is that motors don't all start at the exact same instant if you bring circuits up one at a time — which is exactly what our load-management guide recommends.

✓ One big surge at a time

Bringing circuits up one at a time means only one motor is starting at once — so you plan for the biggest single surge, not all of them stacked together.

The switch's own rating

The transfer switch has a rating too, and it needs to fit the generator — but this part is the electrician's to confirm.

A transfer switch and its inlet are rated for a certain amount of power (measured in amps). Your electrician chooses a switch and inlet whose rating matches your generator's output outlet, so the connection is safe and nothing is asked to carry more than it should. You don't have to calculate this — but it's good to know it's part of the plan.

This is one more reason the two have to be considered together: the generator, the switch, and the cord all need to agree. Our inlet-box-and-cord guide covers the connection side.

! Ratings must match — let the pro confirm

Mismatching the switch, inlet, cord, and generator can be unsafe. This is precisely the kind of thing a licensed electrician gets right and a guess gets wrong.

The 240-volt question

Big loads like a well pump bring 240 volts into the picture, and that shapes your generator choice.

A 240-volt load — most commonly a well pump, but also things like an electric water heater or central air — needs a generator that provides 240-volt power and a switch set up for it. Not every small generator does. If a well pump is on your list, your generator must offer 240-volt output with enough surge capacity for that pump's big starting jolt.

Our well-pump guide goes deeper on this, because it's the single biggest sizing factor for rural homes. If you're on a well, size around the pump first.

★ On a well? Start with the pump

The well pump usually dominates rural sizing. Send me its nameplate and I'll help you understand what generator it really needs. (330) 200-8042.

Two kinds of homes, two sets of needs

Sizing plays out very differently in town than out on a well, mostly because of that one big motor.

If you live in town or the suburbs

In town, without a well pump, your biggest surger is usually the refrigerator or the furnace blower — meaningful, but manageable for a typical portable generator. Sizing is more forgiving here.

- Your biggest single surge is likely the fridge or furnace blower.
- A modest portable generator often covers an in-town list comfortably.
- Add steady loads (lights, TV) fairly freely, watching the running total.
- 240-volt loads are less common in town unless you have central air or electric heat.

If you are out in the country on a well

Out on a well, the 240-volt pump's large starting surge usually sets the size of the whole system. Get the generator right for the pump, and the rest of the list tends to fit around it.

- The well pump's starting surge is often the single biggest number in your whole plan.
- You need a generator with 240-volt output and generous surge headroom — see our well-pump guide.
- A sump pump adds another motor surge to plan around.
- Undersizing here doesn't just trip the generator — it can strain the pump motor, so size generously.

★ Let's size around your biggest load

Whether it's a furnace blower in town or a well pump in the country, I'll help you size around your biggest surger. Call (330) 200-8042.

Why you leave headroom

A generator shouldn't be run flat-out all the time, so we never size right to the edge.

Running a generator at its absolute maximum continuously is hard on it and leaves no cushion for surprises — a motor cycling on, a cloudy day when you want an extra light. Sizing with headroom means planning to use comfortably less than the generator's peak, so it runs cooler, lasts longer, and handles the occasional extra draw without complaint.

✓ Comfortably under, not right at

Think of your generator's maximum like the top speed on a car — fine for a moment, not for cruising. Plan to live below it.

When your wish list outgrows your generator

It happens often, and it's not a problem — just a signal to prioritize or stagger.

If your must-run total is more than your generator can handle, you have two friendly options. First, trim: revisit the priority ladder in our choosing-your-circuits guide and drop comfort items. Second, stagger: don't run everything at once — cycle between, say, the well pump and other loads, since you don't need water pumping every minute.

Both let a smaller generator serve a bigger list gracefully. The only wrong move is forcing it all on at once and overloading.

✓ Stagger, don't strain

You rarely need everything on at the very same moment. Cycling loads lets a modest generator cover surprisingly much.

Sizing when you're buying the generator

Starting fresh lets you size the generator to your needs — the ideal order.

If you haven't bought a generator yet, build your must-run list first, total up its running watts, add your biggest single surge, and add headroom. Then shop for a generator whose starting-watts capacity comfortably exceeds that number — and, if you have a well pump, one that provides 240-volt power. Let your real needs pick the generator, not a salesman's round number.

★ I'll help you shop smart

I don't sell generators and earn no commission, so my only goal is getting you the right size. Bring me your list and I'll help you shop. (330) 200-8042.

Sizing when you already own a generator

If the generator's a given, we size the list to fit it — and that's perfectly workable.

Read your generator's nameplate for its running and starting watts. That capacity is your budget. Build a must-run list whose total — running watts plus the biggest surge, with headroom — fits inside it. If your dream list is bigger, trim or stagger as we discussed. The generator you have can usually cover the true essentials of most homes.

★ Work backward from what you have

Owning the generator already makes this concrete. Send me its nameplate and we'll build a list that fits it nicely. (330) 200-8042.

Matching the inlet and cord

Sizing isn't only about watts — the physical connection has to match too.

The generator cord and the outdoor inlet box must match your generator's output outlet and carry its power safely. Your electrician picks an inlet, cord, and switch that all agree with the generator. If you already own a cord or generator, bring the details so everything lines up. Our inlet-box-and-cord guide covers this piece in plain English.

✓ Bring the generator's details

The plug on your generator determines the cord and inlet. A photo of the generator's outlet panel saves everyone guesswork.

Common sizing mistakes

A few slip-ups cause most sizing headaches. Here's how to dodge them.

- **Forgetting the starting surge** and sizing only for steady watts — then stalling when a motor kicks on.
- **Adding every surge together** instead of just the biggest, and over-buying (bring circuits up one at a time instead).
- **Sizing to the generator's maximum** with no headroom.
- **Overlooking the 240-volt well pump** and buying a generator that can't power it.
- **Trusting internet numbers** instead of reading your own nameplates.

! Your nameplates beat any chart

General charts online can be way off for your specific gear. Your own nameplates are the honest source — use them.

Let the electrician confirm it

You can do the thinking; the electrician does the confirming and the wiring.

Bring your list, your nameplate numbers, and your generator's details to the electrician. They'll confirm the switch and inlet ratings, verify the generator can handle your list with its surges, and flag anything that won't fit. Your homework makes their job faster and your setup more accurate — but the final sizing and all the wiring are theirs.

★ I'll prep you for that conversation

Come to the electrician ready. I'll help you gather the numbers and understand them first, so nothing gets lost in jargon. (330) 200-8042.

A simple worksheet to fill in

Copy this onto paper and fill it with your own numbers — no figures from me needed.

Step	What to write down
Running total	Add running watts of all items on at once
Biggest surge	The single largest starting surge on the list
Your peak	Running total plus that biggest surge
Generator capacity	Its starting watts, from the nameplate
Headroom check	Is your peak comfortably below capacity?

If the last row is a comfortable 'yes,' your list fits. If it's 'no' or 'barely,' trim or stagger — or size up the generator.

✓ **One page tells the story**

This little worksheet, filled with your real nameplate numbers, answers the whole sizing question at a glance.

Sizing myths

A few comforting myths lead people astray. Here's the truth.

- **'A bigger transfer switch means more power.'** No — the generator sets your power; the switch only routes it.
- **'If it fit last time, it fits forever.'** New appliances or a new pump can change your numbers.
- **'Watts are watts.'** Starting watts can be several times running watts — the surge is what bites.
- **'I can run it at max all night.'** Running flat-out is hard on a generator; leave headroom.

! Respect the surge

The most common sizing mistake is ignoring the starting surge. Respect it, and your generator will run happily for years.

Common Questions

The questions I hear most about sizing.

Q: What's the difference between running and starting watts?

Running watts are the steady power a thing uses; starting watts are a brief, larger jolt motors need to get going — often several times the running figure.

Q: How do I find out how many watts my appliances use?

Check each appliance's nameplate. It may list watts directly, or volts and amps you can multiply for a rough figure. Photos make it easy to share and total up.

Q: Do I add up all the starting surges?

No — just the single biggest one, as long as you bring circuits up one at a time so only one motor starts at once. That's what our load-management guide recommends.

Q: Does the transfer switch size affect how much I can run?

The switch must be rated to match your generator, but it doesn't create power. Your generator's capacity is the real limit on how much you can run.

★ Want help with your numbers?

Send me your nameplates and list at (330) 200-8042 and I'll help you total it up — with your real figures, never guesses.

How I help with sizing

This is where a patient helper really earns their keep, and I'm glad to be that person.

I'll help you find and read your nameplates, total up your list the right way, identify your biggest surge, and see honestly whether your generator fits — or what size you'd need if you're buying. Then I hand it all to a licensed electrician to confirm and wire. You get the understanding; the pro does the work. No commission, no upselling — just the right size for your home.

★ Let's get your numbers right

Sizing feels technical until someone sits with you. Let me be that someone. Call or text (330) 200-8042.

The short version to carry with you

If the details blur, hold onto these.

- ❑ Running watts are steady; starting watts are a brief motor jolt — plan for both.
- ❑ Total the running watts of what's on at once, add the single biggest surge, leave headroom.
- ❑ Read your own nameplates — they beat any online chart.
- ❑ The generator sets your limit; the switch and cord just have to match it.

✓ Keep this guide handy

When you gather your nameplates, this page turns them into a clear answer.

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 transfer switch to your generator 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.

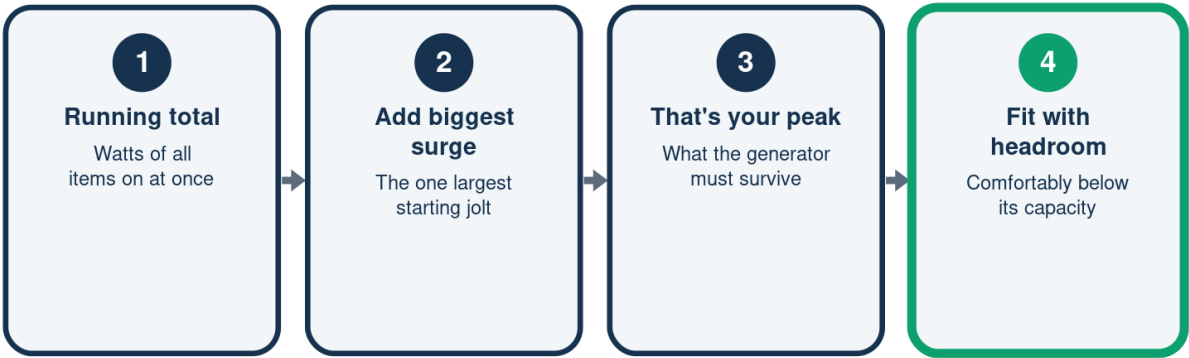
When you'd rather have a hand, that's exactly what I do. I come to your home, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day,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

★ Bill's Home Tech — real help, close to home

Call or text me at (330) 200-8042, or visit BillsHomeTech.com. Serving Atwater and all of Portage County. 30+ years of patient, plain-English tech help — and if you're ever not 100% happy with a visit, I'll make it right or refund it. That's a promise. — Bill

The Sizing Recipe

Fill in your own numbers -- no guessing



Bring circuits up one at a time, so only one motor surges.

What Surges, What Doesn't

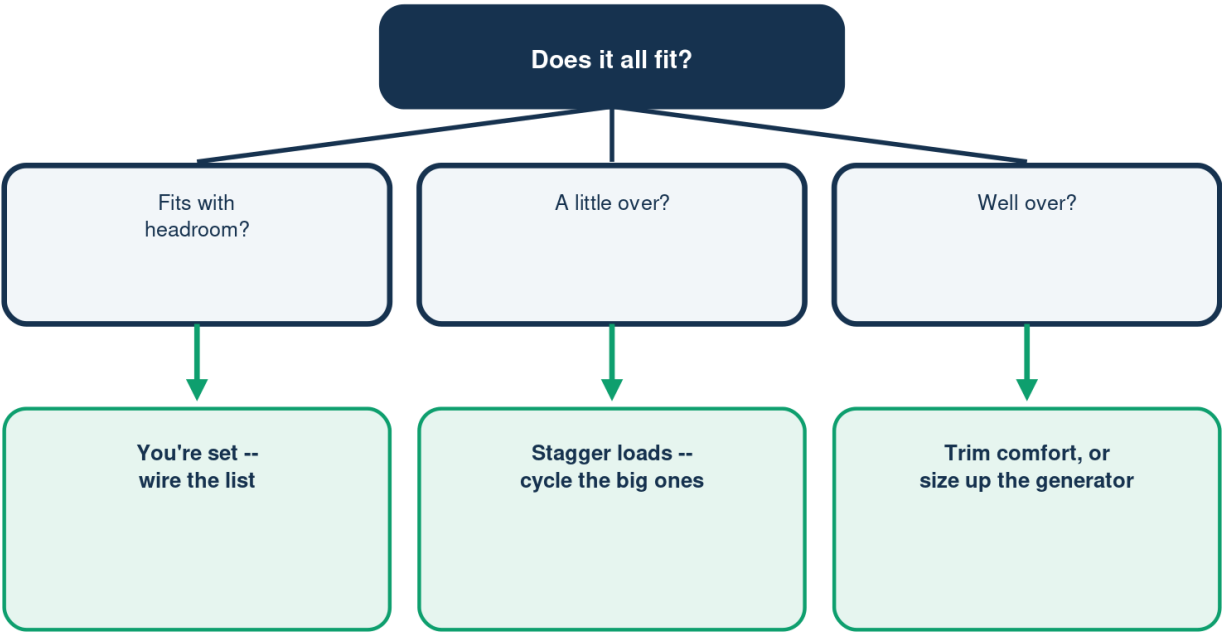
Where the sizing pressure comes from

	Surges (motors)	Steady (no surge)
Kitchen	Fridge, freezer	Kettle, coffee
Comfort	Air conditioner	Lights, TV
Water/heat	Well & sump pumps	Space heater
Plan for	The biggest surge	Just steady watts

Your biggest single surge -- often a pump -- shapes the size.

List Bigger Than the Generator?

Two friendly fixes

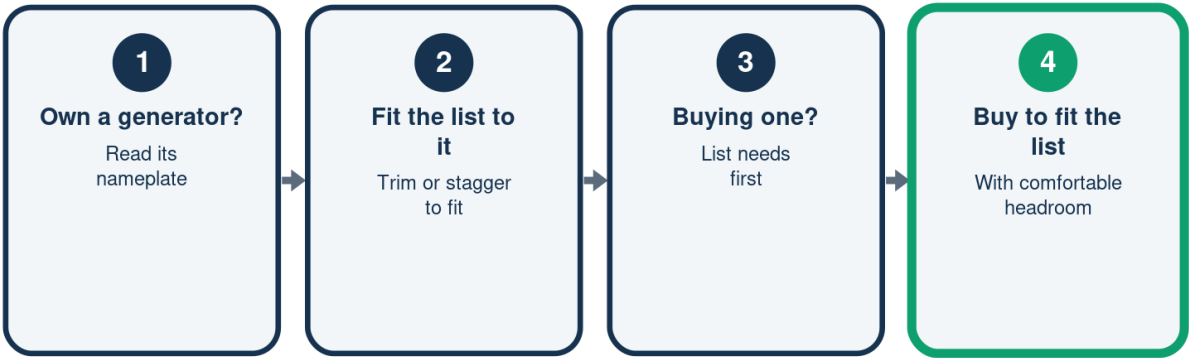


Never force it all on at once -- that's how you overload.

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

Two Ways to Size

Depending on what you have



Either way, your nameplates -- not the internet -- give the numbers.



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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.

— *Bill*



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