



An Extended Guide · No. 1604

Sizing for a Window AC or Space Heater

Cooling and heating
without blowing your budget

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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. A window air conditioner and a space heater sit at opposite ends of this — the air conditioner takes a big starting jolt, while a heater takes no jolt at all but a heavy, steady appetite — so size each for the trouble it actually brings.

Comfort without blowing your budget

Staying cool in a summer outage or warm in a winter one is about comfort, and sometimes about safety. This guide helps you size for a window air conditioner or a space heater without buying far more than you need.

I'm Bill. Cooling and heating are the two loads folks most often get wrong in opposite directions. They forget that an air conditioner takes a big starting jolt, so it won't start — or they underestimate how much steady power a space heater quietly gobbles, so everything else bogs down. Both are easy to get right once you see the difference.

That difference is the whole guide: an air conditioner surges but runs modestly once going, while a heater never surges but has a big, steady appetite. Our running-watts-versus-starting guide explains the two-number idea underneath it all.

★ Not sure which you can run?

Tell me whether you're planning for summer heat or winter cold, and call or text me at (330) 200-8042. I'll help you size a comfort load that fits your backup — free, with nothing to sell you.

The whole idea, on one page

If you remember only this page, you already understand both loads.

- ❑ A window or portable AC is a compressor motor — it surges with a big starting jolt, then runs modestly.
- ❑ A space heater makes heat with no surge at all, but it's a heavy, steady draw the whole time it's on.
- ❑ So you size an AC for its surge, and a heater for its steady appetite — two different problems.
- ❑ Central AC is a much bigger ask than a window unit — that points toward a standby generator or a soft starter.
- ❑ A soft starter can shrink a window or central AC's surge so a smaller unit can start it.
- ❑ Read the nameplate on each, add a margin, and cycle comfort loads rather than running everything at once.

✓ The one-sentence version

For an air conditioner, make sure your unit can deliver the starting jolt; for a heater, make sure your steady total has room for its big, constant appetite.

One surges, the other is a steady hog

These two comfort loads behave in almost opposite ways, and that's the key to sizing them.

An air conditioner has a compressor — a motor — so it demands a big brief jolt to start, then settles down to a fairly modest steady draw. The surge is the challenge; once it's running, it's well behaved.

A space heater is the mirror image. It has no motor, so there's no surge at all — but it turns electricity straight into heat, and making heat is watt-hungry. It draws heavily and steadily the entire time it's on. The steady appetite is the challenge, not the start.

✓ Two loads, two different worries

With an AC, ask: can my unit deliver the starting jolt? With a heater, ask: does my steady total have room for a big, constant draw? Different questions, different answers.

The window AC — a compressor that surges

A window or portable air conditioner is really a small refrigerator for a room, and its compressor behaves like one.

When the compressor kicks on, it asks for a big brief jolt — several times its running watts — to get moving, just like a fridge does. That surge is large for the unit's size, and it's what your backup has to be able to deliver, or the AC hums and won't start.

Once it's running, though, a window unit settles to a modest steady draw. So the compressor's surge, not its running watts, is usually the number that decides whether your backup can handle it. Our running-watts-versus-starting guide covers why motors surge.

✓ Size for the compressor's jolt

A window AC's surge shares the single-biggest-surge slot with your other motors. If it's the biggest jolt on your list, size around it and give it headroom.

The space heater — no surge, but a big steady appetite

A heater is refreshingly simple to picture, and quietly one of the hungriest things you can plug in.

Because it just turns electricity into heat with no motor, a space heater has no starting surge — it draws the same heavy amount the instant you switch it on as it does an hour later. There's no jolt to plan for, only a steady appetite.

But that appetite is large. Electric heat is genuinely watt-hungry, and a single heater can take up a big share of a modest backup's steady capacity all by itself. Run two, and you can crowd out everything else on your list.

! Heaters add up faster than anything else

It's easy to plug in a second or third heater without thinking, because none of them surges. But their steady draws stack straight up, and they can overload a backup that was handling everything else just fine.

Reading the nameplate on each

As always, the real numbers live on the label, not in a guess — and the two loads point you to different figures.

On an air conditioner, look for the watts, and for any starting or locked-rotor figure — that's your clue to the compressor's surge. On a space heater, you mostly care about the steady watts, since it has no surge; heaters often list a couple of heat settings, each with its own draw.

If only volts and amps are shown, multiply them for the running watts. Photograph each label before you shop. Our guide on reading a nameplate walks through every marking you might see.

★ Send me the labels

Snap a photo of the AC's and the heater's labels and text them to me at (330) 200-8042. I'll help you read the surge and the steady draw off each one — free, no obligation.

Sizing to start one air conditioner

For an AC, the whole question is whether your backup can deliver the compressor's starting jolt.

Add the AC's running watts to your steady total, then make sure your unit's surge rating clears the compressor's starting jolt on top — with headroom, not right at the edge. If the AC is the biggest surge on your list, it sets the bar; if a fridge or well pump is bigger, that one does.

Because the compressor cycles on and off, you only ever face one such jolt at a time from it. Size for the single biggest surge among all your motors, plus your steady running total, plus a margin.

✓ Start it before you load up

When you're running on backup, start the AC before you pile on other loads, so its surge has all the headroom it needs to catch. Then bring the rest back on.

Sizing to run a heater or two

For heaters, forget the surge entirely — it's all about the steady total.

Since a heater has no jolt, you simply add its steady watts to your running total. The catch is how big that steady draw is: one heater takes a real bite out of a modest backup, and a couple of them together can eat most of its capacity.

So decide honestly how many heaters you truly need running at once. Often, heating one room you're actually in beats trying to warm the whole house and overloading your backup in the process.

! Watch the steady total with electric heat

Because heaters don't surge, nothing warns you that you're near the edge until something bogs down or a breaker trips. Add up their steady draws deliberately, and leave a margin above the total.

One room, not the whole house

The size of the comfort you're after changes the size of the backup you need — a lot.

A window air conditioner cooling one room, or a heater warming one room, is a manageable load for many portable backups. Cooling or heating the whole house is a different order of magnitude.

Central air, in particular, is a much bigger compressor with a much bigger surge than a window unit — often too big for a modest portable. That points toward a permanently installed standby generator, or a soft starter to tame the surge. Our guide on sizing a standby generator covers the whole-house route.

✓ Right-size the goal, not just the machine

Deciding to keep one room comfortable, rather than the whole house, is often the single biggest thing you can do to keep your backup — and your budget — reasonable.

A soft starter can tame an AC's surge

If an air conditioner's starting jolt is the one number pushing you toward a bigger unit, there's an honest way to shrink it.

A soft starter is a small device a licensed pro installs on the air conditioner — most often a central-air compressor, sometimes a window unit — that eases it up to speed so its starting surge is much smaller. A smaller surge can let a more modest backup start the AC that couldn't before.

It shrinks the surge, not the running watts — the steady draw once the AC is going stays the same. Our guide on the well-pump surge covers soft starters in more depth, since the same device tames a well pump's jolt too.

✓ Ask whether yours is a candidate

For a home where the air conditioner is the single stubborn surge, a soft starter can be the difference between a unit that fits and one that doesn't. A licensed electrician can tell you if yours qualifies.

Two kinds of homes, two sets of needs

How easily you can run a comfort load depends on what else is competing for your backup's capacity — and that's mostly about where you live.

If you live in town or the suburbs

In town or a close-in suburb, a comfort load often stands nearly alone. City water means no well pump on the list, so a window AC's surge or a heater's steady draw has more of your backup to itself.

- A window AC in the bedroom during a summer outage is a common, manageable goal for a portable backup.
- With no well pump competing, the AC's compressor surge may be the single biggest jolt on your list.
- A space heater's steady draw shares your running total mainly with the fridge and lights.
- Our running-watts-versus-starting guide helps you match this to the right size class.

If you are out in the country on a well

Out in the country, a comfort load has to share the stage with the well pump — the biggest jolt of all — and that changes the arithmetic in both seasons.

- In summer, the well pump's surge and a window AC's surge compete for the single-biggest-surge slot — size for the larger, with room to spare.
- In winter, an electric space heater's heavy steady draw competes with the well pump's steady running watts — a real squeeze on a modest backup.
- Give the well pump priority; a comfort load is usually a want, not a must. Our guide on sizing for a well pump covers that load.
- Read every nameplate — the pump, the AC, the heater — rather than guessing which one dominates.

★ Let's fit comfort around your must-run list

Tell me your season, your comfort load, and whether you're on a well, and I'll help you size it so the essentials still come first. Call (330) 200-8042.

Taking turns with comfort loads

You don't have to run everything at once, and that fact can let a smaller backup keep you comfortable.

Cool or heat one room while you're in it, then move the unit — or your attention — rather than trying to condition the whole house at once. Run the AC to take the edge off, then give the backup a breather for other loads. A heater in the room you're actually using beats three heaters warming empty ones.

This taking-turns approach is especially handy when a comfort load and a big motor like the well pump both want capacity. Our guide on managing loads during a run covers cycling in full.

✓ Cycling is a strategy, not a compromise

Plenty of experienced backup owners cycle comfort loads on purpose — it's gentler on the engine and the fuel tank, and it lets a modest unit cover a longer list than it could all at once.

Gentler helpers that sip instead of gulp

Sometimes the thriftiest comfort doesn't come from the hungriest machine.

- **Fans** use a fraction of what an air conditioner does, and moving air can make a warm room feel much cooler.
- **Warm layers and blankets** let a single small heater keep you comfortable instead of running several.
- **Closing off a room** — shutting doors, drawing curtains against the sun — means the comfort load works less and draws less.
- **A heat pump**, if you have one, is far more efficient than a resistive heater, though it's a bigger, motor-driven load to size for.

✓ Small moves shrink the load

Before you size up your backup, size down the job. A fan, a closed door, and a warm sweater can turn an impossible comfort load into an easy one.

Signs you're asking too much of your backup

Cooling and heating are among the loads most likely to push a backup too far. Here's how to recognize it.

- ❑ Lights dim or flicker the moment the AC compressor tries to start.
- ❑ The AC hums or struggles but won't quite kick on.
- ❑ A generator's engine bogs down, or a breaker trips, when a heater is already running.
- ❑ A power station flashes an overload warning and shuts off the outlet.

! Lighten the load, don't force it

If the AC won't start, free up surge headroom by turning something else off first, then try again — rather than forcing it over and over, which strains both the compressor and the unit. If a heater keeps tripping a breaker, you're simply drawing more steady power than the backup can give.

Common comfort-load sizing mistakes

A handful of avoidable slip-ups account for most comfort-load regret. Now you'll spot them coming.

- **Sizing an AC to its running watts** and forgetting the compressor's big starting surge.
- **Underestimating a heater's steady draw** because it doesn't surge, then overloading the backup.
- **Running two or three heaters** whose steady draws quietly stack up past the backup's ceiling.
- **Expecting a modest portable to run central air**, which has a far bigger surge than a window unit.
- **Trying to condition the whole house** instead of one room, and buying far more backup than comfort really needs.

! The two mistakes mirror each other

With an AC, the trap is forgetting the surge. With a heater, it's underestimating the steady draw. Keep both in mind and you'll avoid the great majority of comfort-load trouble.

Comfort is usually a want, not a must

It helps to be honest about where a comfort load sits on your list.

For most homes, keeping the fridge cold, the sump pumping, and — on a well — the water flowing comes first. Cooling or heating is often a want that fits in around those essentials, rather than the thing you size the whole backup around. Our guide on making your must-run list helps you sort must from want.

That said, comfort can become a genuine safety need — in a summer heat wave for someone frail, or a hard winter freeze. When it does, size for it deliberately, and consider running that one room reliably rather than the whole house thinly.

✓ Rank it honestly

Deciding early whether comfort is a want or a real need for your household keeps you from either overbuying or being caught short when it matters most.

Questions worth asking

Whether you're talking to a salesperson, an electrician, or me, these get you to the right answer.

Q: Is this number the AC's running watts or its starting surge?

Always ask which one a quoted figure is. For an air conditioner you need both — the running watts for your steady total and the larger starting surge for the compressor's jolt.

Q: Can my backup start the air conditioner, not just run it?

Starting and running are different asks. Make sure the unit's surge rating clears the compressor's jolt with room to spare, not just its running watts.

Q: How many space heaters can I run at once?

Add up their steady watts and compare to your backup's running capacity, leaving a margin. Since heaters don't surge, it's purely a steady-total question — and the total climbs fast.

Q: Would a soft starter help with my air conditioner?

Often, yes — especially for central air, sometimes a window unit. A licensed electrician can tell you if your AC is a candidate, since it shrinks the surge you must size around.

✓ There's no silly question

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

A quick self-check at your kitchen table

You can pressure-test your comfort-load plan in about a minute with these questions.

- ☐ For an AC, do I know its starting surge, not just its running watts?
- ☐ For a heater, have I added its heavy steady draw to my running total?
- ☐ Is the AC's surge covered by my unit's surge rating, with headroom?
- ☐ Am I planning for one room, or have I bitten off the whole house?
- ☐ Have I considered a fan, a warm layer, or a soft starter to shrink the load?

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

That's exactly what this guide, and a friendly phone call, are for. Reach me at (330) 200-8042 and we'll fill in the blanks together.

Common Questions

The cooling-and-heating questions I hear most often, answered plainly.

Q: Why won't my window AC start on my backup?

Almost always its compressor's starting surge came up short. A window AC surges several times its running watts to start; your unit needs the surge headroom, not just enough for the steady draw.

Q: Why does one little space heater use so much power?

Because making heat is watt-hungry — a heater turns electricity straight into heat with no efficiency trick. It has no surge, but its steady draw is large the whole time it's on.

Q: Can I run my central air on a portable generator?

Usually not comfortably — central air has a much bigger surge than a window unit. That points toward a standby generator or a soft starter; see our guides on those.

Q: Is it better to cool one room or the whole house?

For most portable backups, one room. Conditioning the whole house is a far bigger load; keeping one room comfortable is kinder to your backup and your budget.

★ Still weighing cooling or heating?

Send me your comfort load and your must-run list at (330) 200-8042, and we'll figure out what fits your backup, season by season.

Where comfort loads fit in the bigger picture

A window AC or a heater is one item on a larger must-run list, and it plays best when it fits around the essentials.

Size the essentials first — the fridge, the sump, the well pump — then see how much comfort your backup can add on top, cycling loads if need be. An air conditioner competes for the biggest-surge slot; a heater competes for steady capacity. Knowing which is which keeps the whole plan balanced.

Our running-watts-versus-starting guide explains the two-number idea, our guide on managing loads during a run covers taking turns, and our guide on the well-pump surge covers soft starters and the biggest rural jolt.

✓ Comfort fits around the essentials

When comfort is a want, let it fill the room your essentials leave behind. When it's a real need, size for it on purpose and consider one room done reliably.

Bringing it all together

Cooling and heating come down to one clear contrast: an air conditioner surges, a heater is a steady hog — and you size each for the trouble it brings.

For an AC, cover the compressor's starting jolt with headroom. For a heater, make room in your steady total for its big, constant appetite. Read each nameplate, add a margin, cycle loads, and consider a fan, a warm layer, or a soft starter to shrink the job.

Our running-watts-versus-starting guide covers the two numbers, our guide on managing loads during a run covers cycling, and our guides on the well pump and a standby generator cover the bigger surges and the whole-house route.

★ Let's keep you comfortable, sensibly

If you'd rather talk it through than puzzle it out on paper, that's what I'm here for. Call or text me at (330) 200-8042 with your season and your list — 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 backup power for a window AC or space heater 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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AC vs. Space Heater

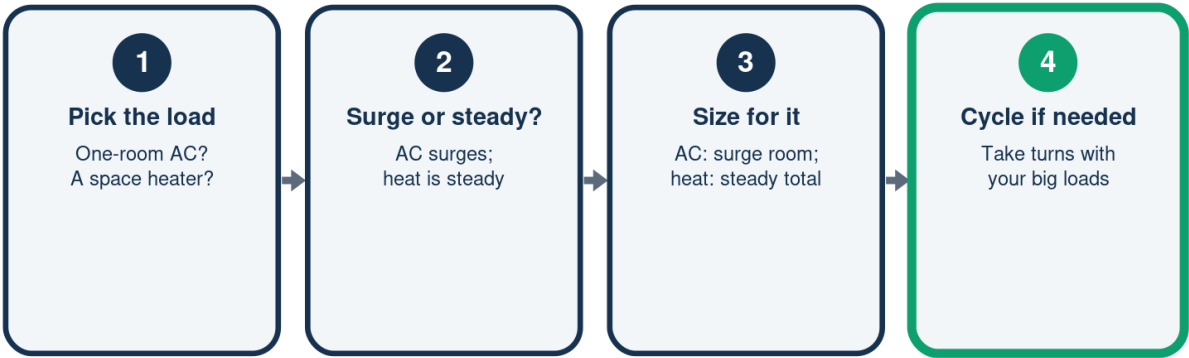
Two very different appetites

	Surge on start?	Steady appetite
Window / portable AC	Yes, a big jolt	Fairly modest
Space heater	None at all	Heavy, constant
Electric heat overall	None	Very watt-hungry
Ceiling or box fan	Tiny, if any	Very light

Size an AC for its surge; size a heater for its steady draw.

Sizing a Comfort Load

Four steps for cooling or heating



Read the nameplate first -- never guess the watts.

How Big Is the Ask?

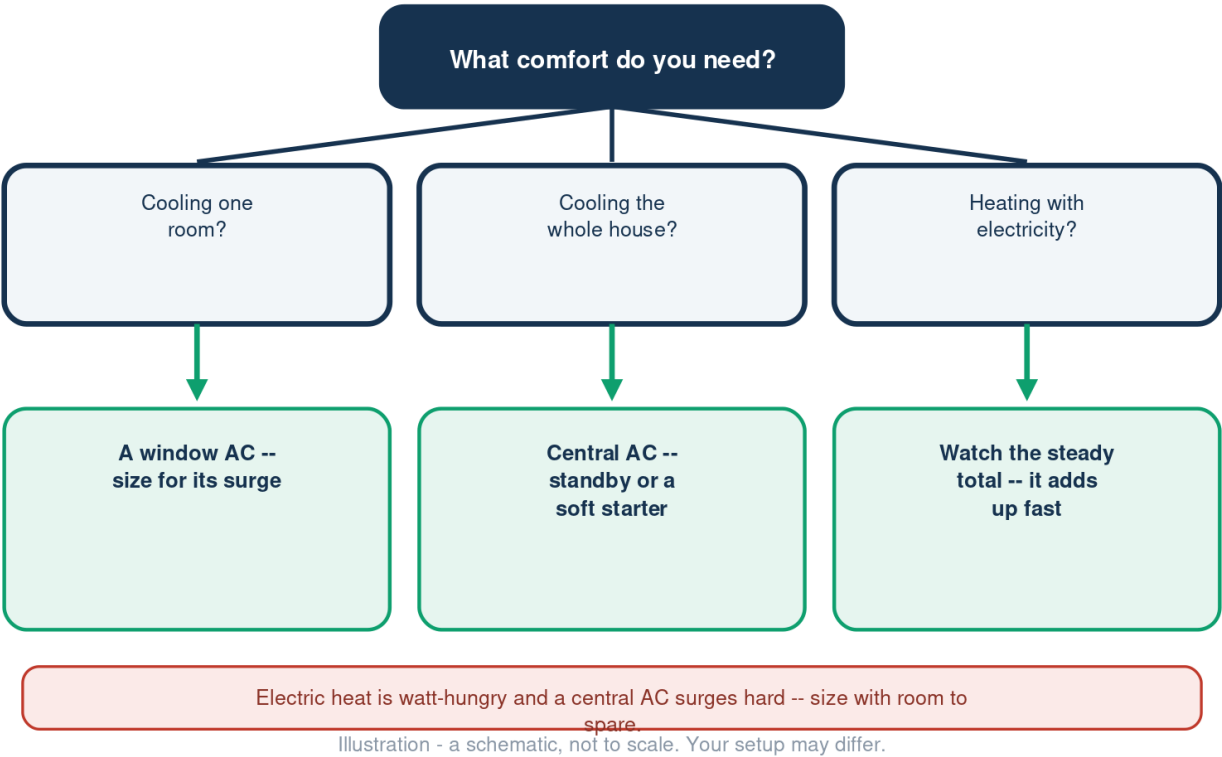
Three comfort loads, three sizing problems

	Window AC	Central AC	Space heater
Surge to start?	A real jolt	A big jolt	None
Steady draw	Modest	Large	Heavy
How to power it	Portable is fine	Standby / soft start	Watch the total

Central air is a much bigger ask than a window unit.

Summer or Winter Need?

Let the season and the goal point the way





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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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