



An Extended Guide · No. 1601

The Well-Pump Surge Problem (and Soft Starters)

Taming the biggest
jolt on a rural list

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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 well pump is the sharpest test of all this — its starting jolt is usually the single biggest surge in the whole house, so give it real room to spare rather than sizing right to the edge.

The one motor worth getting right

If you're on a private well, this is the guide that matters most. The well pump is the trickiest item to size and the costliest to get wrong — but once you take it step by step, it stops being frightening.

I'm Bill. On a country property, the well pump is the make-or-break part of your backup plan. Get it right and everything else on your list — the fridge, the lights, the furnace blower — fits comfortably underneath it. Get it wrong and the pump just hums and heats while your taps stay dry.

We'll go slow. First why the pump asks for such a big jolt, then how to size for it with room to spare, then the 240-volt hookup and a clever little device called a soft starter that can shrink the whole problem. Our running-watts-versus-starting guide explains the two-number idea underneath all of this if you'd like the groundwork first.

★ You don't have to sort the pump out alone

Tell me your pump's nameplate or horsepower and the rest of your list, and call or text me at (330) 200-8042. I'll help you land on a surge number you can trust — free, with nothing to sell you.

The whole idea, on one page

If you remember only this page, you already understand the heart of well-pump sizing.

- ❑ Most home wells use a 240-volt submersible pump with a big starting surge — often around three times its running watts.
- ❑ That surge is usually the single biggest jolt in the house, so you size the whole plan around it.
- ❑ You can't run a 240-volt pump off a plain cord — it needs a transfer switch or interlock and a 240-volt outlet.
- ❑ Give the surge generous headroom. Undersize it and the pump hums, heats, and the motor can be damaged.
- ❑ A soft starter, installed by a licensed pro, shrinks the surge so a smaller unit can start the pump.
- ❑ Never guess the wattage — read the pump's nameplate or ask your well company for its horsepower.

✓ The one-sentence version

Pick a unit that can deliver the pump's big starting jolt at 240 volts, with headroom to spare, and the rest of your must-run list fits underneath it.

Why the pump is the number that decides everything

On a rural must-run list, one item towers over all the others.

When the power's out and the pump's off, the taps go dry — no drinking water, no cooking, no flushing, nothing for the animals. That makes the pump a must, not a want, for almost everyone on a well. It earns its place at the top of the list.

It's also the single biggest surge you'll face, which makes it the make-or-break sizing item. So the smart move is to size the whole plan around the pump first, then see what else fits underneath — rather than adding the pump last and hoping there's room.

✓ Size around the pump, not around the rest

Choose a unit that can start the pump comfortably, then fit the fridge, the lights, and the furnace blower beneath it. The pump sets the ceiling; everything else lives under it.

The pump's two numbers — and why the second is so big

Like every motor, a well pump has two watt numbers that do very different jobs.

The **running watts** is the steady draw once the water is moving — well behaved, and the smaller of the two. The **starting surge** is the brief, much bigger jolt the motor needs for a second or two to get spinning, and for a well pump that jolt is often around three times its running watts.

The surge passes almost instantly, but your unit has to be able to deliver it the moment the pump calls for it, or the pump simply won't start. Sizing to the running number alone is the classic mistake — our running-watts-versus-starting guide walks through the two-number idea in full.

✓ The surge is the number that fools people

A unit sized only to the pump's steady running watts will leave it humming and struggling. It's the big brief jolt on top that you have to plan for.

Why a well pump asks for such a big jolt

It helps to picture where that motor actually sits and what it's being asked to do.

The pump is down the well, underwater, and its job is to push a tall column of water all the way up to the house. Starting that heavy column moving from a dead stop takes a mighty first shove — far more than keeping it moving once it's underway.

That's why a well pump's surge tends to be larger, for its size, than a fridge's or a fan's, and why it's usually the biggest single jolt on the whole property. The pump is quietly the hardest-working motor you own.

✓ It's working harder than it looks

There's nothing wrong with a pump that needs a big jolt — it's simply doing a big job. Your task is to make sure the unit can give it that jolt without straining.

The 240-volt reality — you can't just run a cord

Here's the part that catches folks by surprise, and it changes the whole plan.

Most home wells use a 240-volt submersible pump. You cannot practically feed a 240-volt pump with an ordinary extension cord from a generator the way you would a lamp or a fridge — the voltage and the wiring are a different animal.

Instead, the pump is connected through a transfer switch or an interlock at your electrical panel, and your unit needs a 240-volt outlet plus enough surge headroom to start it. That means the size and the hookup have to be planned together. Our guide on your transfer switch's circuit count goes deeper on the wiring side.

★ Let's plan the size and the hookup together

The pump's number and its 240-volt connection are two halves of one plan. Call or text me at (330) 200-8042 and I'll help with both — and line up a licensed electrician for the panel work.

Finding your pump's real numbers

Never guess a pump's wattage. There are a few reliable places to find its real figures.

- **Inside the well cap** or on the pump's own paperwork, if you have it tucked away with your home records.
- **On a tag at the pressure tank** in the basement or utility room, where the system controls often live.
- **On the breaker** in your panel that feeds the pump — it's usually a double-width 240-volt breaker.
- **From your well company:** the folks who drilled or service the well can tell you the pump's horsepower from their records.

★ Photograph what you find

Snap a picture of any nameplate, tag, or breaker and text it to me at (330) 200-8042. I'll help you turn a horsepower figure or a nameplate into a sensible surge number to shop with — free.

Size the surge with room to spare

This is where a little generosity pays for itself many times over.

Take the pump's starting surge and make sure your unit's surge rating clears it comfortably, with headroom on top — not sized right to the edge. When you're torn between two sizes, step up rather than down. The pump is not the place to shave the number thin.

Why so careful? Because an undersized unit can't deliver the jolt the pump demands, so the motor hums, strains, and heats up instead of starting. That's hard on the pump and hard on the unit trying to start it.

! An undersized pump can be damaged — don't force it

If the pump hums and won't catch, shut it off and lighten the load rather than trying again and again. Repeatedly forcing a stubborn start can overheat and damage the motor. If it keeps happening, the surge number was simply too small.

Soft starters — shrinking the jolt

If the pump's surge is pushing you toward a big, heavy, thirsty unit, there's an honest way to shrink it.

A **soft starter** is a small device that a licensed pro installs on the pump. Instead of slamming the motor on at full force, it eases it up to speed — which makes the starting surge much smaller.

A smaller surge can mean a smaller, lighter, quieter unit will start the pump that couldn't before. It's a genuine option, not a gimmick, and it's often the difference between a unit that fits your budget and one that doesn't. Our running-watts-versus-starting guide touches on soft starters too.

✓ Ask whether your pump is a candidate

A licensed electrician or your well company can tell you whether a soft starter suits your particular pump and controls. It's a question well worth asking before you buy a bigger unit.

What a soft starter does — and what it doesn't

Worth being clear on this so your expectations are right from the start.

- It **shrinks the starting surge** — the brief jolt — so a smaller unit can start the pump.
- It does **not** change the running watts — the steady draw once the water is moving stays the same.
- It's installed **by a licensed pro** on the pump side of things, not something you plug in yourself.
- **Confirm compatibility first:** not every pump and control setup is a candidate for one.

✓ Same water, smaller jolt

You still size for the pump's running watts — a soft starter just tames the big surge that used to sit on top. Think of it as smoothing the start, not shrinking the work.

Two kinds of homes, two sets of needs

Whether a well pump belongs on your list at all is the single biggest fork in the road for this guide.

If you live in town or the suburbs

In town or a close-in suburb, you're almost always on city water. That water keeps flowing no matter what the power does, so there's usually no pump to size around at all — a real simplification.

- With city water, there's no well-pump surge on your list, and your biggest jolt is usually just the fridge or a window air conditioner.
- The in-town exceptions are a private well, an irrigation pump, or a booster pump for low water pressure.
- If you do have one of those, size for its surge exactly the way a rural reader would.
- For the fridge-and-AC side of a town list, our running-watts-versus-starting guide is the place to start.

If you are out in the country on a well

Out on a private well, the pump is the whole point of this guide. It dominates your sizing, and no power means no water at all — for drinking, cooking, flushing, or the animals.

- The pump's starting surge is very likely the single biggest number on your entire must-run list.
- It's a 240-volt motor, so it needs a transfer switch or interlock and a unit with a 240-volt outlet.
- Give the surge generous headroom — undersize it and the pump just hums and heats, which is hard on the motor.
- Store several days of drinking water; rural outages run longer. Our guide on a well-and-septic property covers the fuller picture.

★ The pump is where I can help most

Tell me your pump's nameplate or horsepower and the rest of your list, and I'll help you land on a surge number you can trust — then line up a licensed electrician for the 240-volt hookup. Call (330) 200-8042.

A gentler kind of pump

Not every well pump slams on the same way, and that can change your sizing for the better.

Some newer systems use a constant-pressure or variable-speed pump that ramps up smoothly rather than jumping straight to full speed. Because they ease into motion, they tend to start with a smaller jolt than a traditional pump.

If you already have one, or you're due to replace a pump, that gentler start can make backup sizing noticeably easier. Ask your well company what kind of pump you have — it's a useful thing to know before you size anything.

✓ Worth asking about at replacement time

If a pump replacement is on the horizon anyway, a gentler-starting pump is worth a conversation with your well pro. It can shrink the surge you have to plan around for years to come.

The hookup is a licensed electrician's job

Sizing the surge is only half the plan; a 240-volt pump also has to be connected safely.

A 240-volt pump is wired through a transfer switch or an interlock kit installed at your panel by a licensed electrician, usually with a permit. I'm a tech helper, not an electrician — but coordinating a trustworthy one is part of what I do, and I'll gather your numbers and your list so the pro can move fast.

Our guides on your transfer switch's circuit count and on sizing a standby generator carry the wiring side in more detail, including how a 240-volt circuit for the pump fits into the picture.

! Never back-feed the panel yourself

Feeding a generator into a dryer outlet, or with a double-ended so-called suicide cord, can electrocute a lineman working to restore your power and can start a fire. A transfer switch or interlock, installed by a licensed pro, is the only safe way to connect a pump.

No power means no water — plan for it directly

This is the reason the pump matters so much, so it's worth planning around on purpose.

When the pump is off, the whole house goes dry. Even a perfectly sized generator can have an off day, so stored water is your simplest, most reliable backstop — and it costs almost nothing to set aside.

- Store several days of drinking water, and more if you keep livestock.
- Set aside water for flushing too — a filled bathtub or a few jugs goes a long way.
- A battery or power station makes no exhaust and is safe indoors, though many can't deliver the surge to start a 240-volt pump.
- Rural outages tend to run longer, so plan for days rather than hours.

! Water first

Even with a generator you trust, keep stored drinking water on hand. A machine can fail; a few jugs of water never will. This is the one part of the plan that asks nothing of your electrician.

Common well-pump sizing mistakes

Nearly all well-pump regret traces back to a handful of avoidable slip-ups. Now you'll spot them coming.

- **Guessing the pump's wattage** instead of reading the plate or asking the well company for its horsepower.
- **Sizing to the running watts** and forgetting the big starting surge sitting on top.
- **Forgetting the pump is 240 volts**, then discovering a 120-volt-only unit or a plain cord can't run it.
- **Leaving no headroom**, so the pump hums and strains at the unit's very ceiling.
- **Assuming any battery can start it** — many simply can't deliver the surge a 240-volt pump demands.

! The costliest mistake is guessing low on the surge

An undersized surge doesn't just disappoint — it strains the pump that won't start and the unit straining to start it. When your math sits near the line between two sizes, size up.

Questions worth asking

Whether you're talking to your well company, an electrician, or me, these get you to the truth about the pump.

Q: What's my pump's horsepower or nameplate rating?

Your well company usually has this on file, or you may find it inside the well cap or on the breaker. It's the starting point for a real surge number, rather than a guess.

Q: Is my pump 240 volts, and how is it wired?

Almost all home well pumps are 240 volts. Knowing this tells you you'll need a transfer switch or interlock and a unit with a 240-volt outlet — not just a cord.

Q: Would a soft starter let me use a smaller unit?

Often, yes. A licensed pro can tell you if your pump is a candidate, since a soft starter shrinks the surge you have to size around without changing the running watts.

Q: How much headroom should I leave above the surge?

Enough that the unit isn't straining at its ceiling when the pump kicks on. A comfortable cushion, not the bare minimum — and when in doubt, step up a size.

✓ There's no silly question

If the pump still feels like the scary part, that's completely normal. Call or text me at (330) 200-8042 and we'll work through it together.

When to bring in a professional load calculation

The well pump is exactly the kind of load where a pro's measurement earns its keep.

A licensed electrician can do a proper load calculation and even measure the pump's real starting draw with a clamp meter. That turns a guess into a measured number you can size around with confidence.

It's the right call when you're covering the whole house, considering a permanently installed standby unit, or your math sits close to the line between two sizes. Our guide on when to get a professional load calculation walks through exactly what to expect.

★ I'll help you get ready for the pro

I help you gather the pump's numbers and your must-run list, then coordinate the licensed electrician who does the calculation. Call or text me at (330) 200-8042 to get started.

The pump in the whole rural picture

The well pump rarely travels alone on a country property.

Alongside it you may have a septic pump or grinder, a sump pump in the basement, a chest freezer, and a furnace blower — several motors to plan around. The well pump is the biggest single jolt, but the others share the load once it's running.

Our guide on sizing for a well-and-septic property pulls the whole rural picture together, and our guide on sizing a standby generator covers a permanent, automatic option for a home that leans on backup power often.

✓ One plan, not a pile of parts

Size for the pump first, since it sets the ceiling, then fit the freezer and the rest of the list underneath it. That keeps the whole plan coherent instead of piecemeal.

Common Questions

The well-pump questions I hear most often, answered plainly.

Q: Why won't my well pump start on my generator?

Almost always the surge came up short, or the unit isn't set up for 240 volts. The pump's starting jolt is large, so the unit needs both the surge headroom and a 240-volt hookup.

Q: Can I run my well pump off a regular extension cord?

No — a 240-volt pump can't be cord-fed. It's wired through a transfer switch or interlock at your panel by a licensed electrician.

Q: Will a battery or power station run my well pump?

Only if it can deliver the big starting surge at 240 volts, which many can't. Check the unit's surge rating and its outlets, and see our watts-versus-watt-hours guide.

Q: What exactly is a soft starter, and do I need one?

A device a pro installs on the pump to shrink its starting surge, so a smaller unit can start it. It doesn't change the running watts. Worth asking about if the surge is your sticking point.

Q: How much water should I store?

Enough drinking water for several days per person, plus extra for animals and for flushing. Rural outages run longer, so err on the generous side.

★ Still puzzling over the pump?

Send me your pump's nameplate or horsepower and your list at (330) 200-8042, and we'll work through the surge and the hookup together, at your pace.

A quick self-check at your kitchen table

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

- ☐ I know my pump's horsepower or nameplate rating — not a guess.
- ☐ I know it's a 240-volt pump and will need a transfer switch or interlock.
- ☐ My unit's surge rating clears the pump's starting jolt, with headroom.
- ☐ I've asked whether a soft starter could let me use a smaller unit.
- ☐ I've stored several days of drinking water as a backstop.

✓ 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.

Bringing it all together

The well pump is the toughest single item on a rural list, but the plan is straightforward once you take it in order.

Get the pump's real numbers, size its surge with generous headroom, plan the 240-volt hookup with a licensed electrician, and ask whether a soft starter could shrink the jolt. Then fit the rest of your must-run list underneath the pump.

Our running-watts-versus-starting guide explains the two-number idea, our guide on a well-and-septic property covers the fuller rural picture, and our guide on when to get a professional load calculation tells you when a measured number is worth it.

★ Let's get your pump right, together

If you'd rather talk it through than puzzle it out on paper, that's exactly what I'm here for. Call or text me at (330) 200-8042 with your pump's nameplate or horsepower — 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 your well pump 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

A Well Pump's Two Watt Numbers

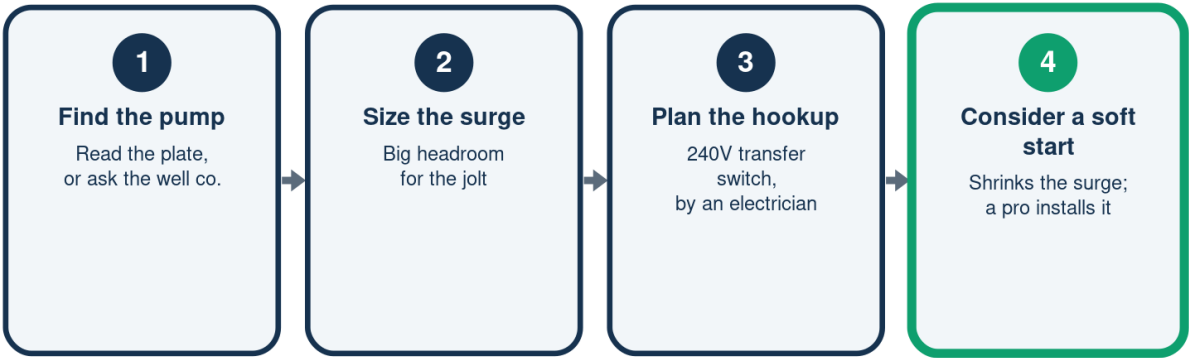
Why its starting surge steals the show

	What it is	How to size
Running watts	Steady, once going	Add to your total
Starting surge	A big brief jolt	Size around this
How big?	Around three times	the running watts
Voltage	Usually 240 volts	Needs a 240V hookup

The pump's surge is usually the single biggest jolt in the house.

Sizing for Your Well Pump

Four steps, taken in order



Get the pump's numbers first -- never guess the wattage.

With and Without a Soft Starter

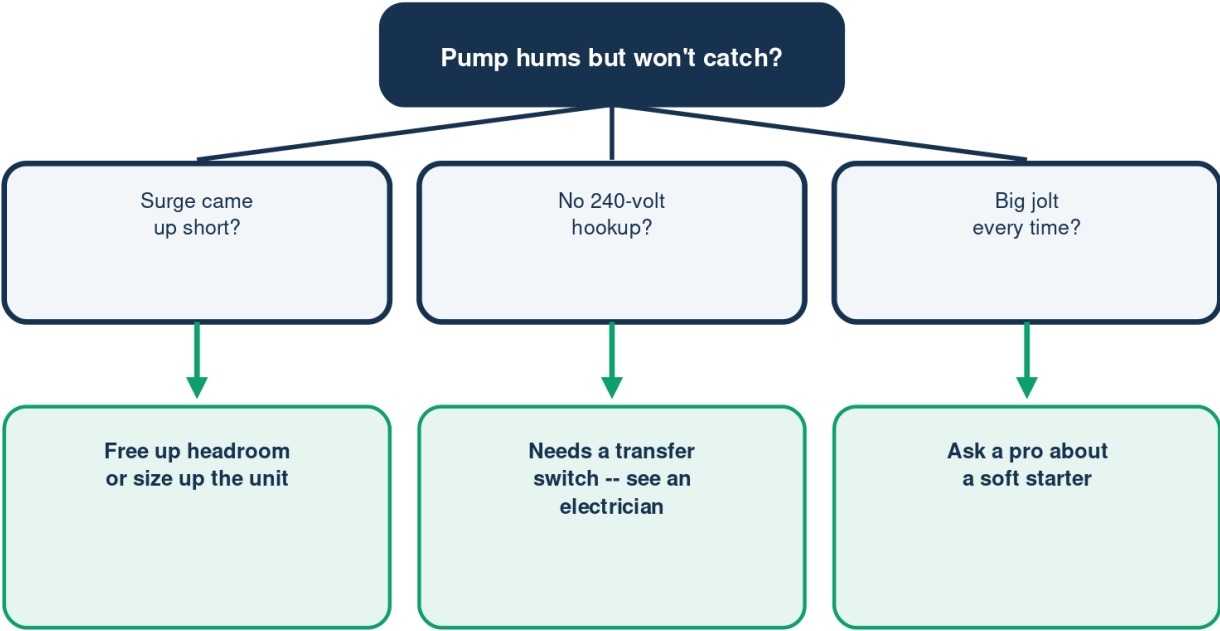
Same pump, a much smaller starting jolt

	Without	With a soft starter
Starting surge	Full big jolt	Much smaller jolt
Unit size needed	Larger	Can be smaller
Running watts	Unchanged	Unchanged
Installed by	Not applicable	A licensed pro

A soft starter shrinks the surge, not the running watts.

Your Pump Hums but Won't Start -- Why?

Let the symptom point to the cause



An undersized surge can overheat and damage the pump motor -- don't force repeated starts.

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.

— *Bill*



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