



An Extended Guide · No. 1707

Protecting Your Pump and Controls

Keeping a costly investment
healthy on backup power

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! Read this first — on a well, no power means no water

On a home with a private well, a power outage isn't just dark — it's dry. The pump that lifts your water runs on your home's electricity, so when the power stops, every tap, toilet, and hose stops with it. Keep a few days of stored drinking water on hand as a backup you can count on — a common guideline is about a gallon per person per day. And know this from the start: a well pump is almost always a 240-volt appliance wired straight into your electrical panel, so any backup hookup for it is a licensed electrician's job. Never try to feed it with a cord or by backfeeding an outlet — that is unsafe, against code, and can put deadly voltage on the power lines outside. A well pump is a big investment down a deep hole — replacing one is a real job. A little protection, especially when you run it on backup power, helps it last for years. That is what this guide is about.

Protecting your pump and its controls

Your well pump works hard and lives out of sight, so it is easy to forget until it fails. This guide covers how to keep it — and its sensitive controls — healthy, especially when running on a generator or battery.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. A pump replacement is one of the pricier surprises a well home can face, partly because the pump often sits far down the well. The good news is that a few sensible habits go a long way toward avoiding that surprise.

Most of what protects a pump is about power — clean power, enough power, and gentle starts. Backup power is where those things need the most attention, which is why this guide belongs in your backup plan. Let's keep your pump happy.

★ Want to protect your investment?

If you would like help making sure your backup setup is kind to your pump, that is exactly the kind of thing I do. Call or text me at (330) 200-8042.

The whole thing, in about a minute

If you remember only these things, your pump is in good hands.

- ❑ Give the pump clean, steady power — sensitive controls dislike rough or unstable power.
- ❑ Use a generator big enough to avoid low-voltage strain, which is hard on any motor.
- ❑ Let a generator settle for a moment before you start the pump, and give the pump a clear runway.
- ❑ A soft starter eases startup stress and can extend pump life.
- ❑ Protect against surges and lightning — a real threat on long rural lines.
- ❑ Never let the pump run dry, and fix short-cycling promptly — both wear a pump out.

✓ Kind power, long life

Nearly everything that protects a pump comes down to giving it kind power: clean, steady, sufficient, and gently started. Do that and your pump rewards you with years of service.

Clean power matters — especially for modern controls

Not all electricity is equally smooth, and your pump's controls can tell the difference.

A plain, older-style pump with a simple pressure switch is fairly rugged. But many newer systems — constant-pressure and variable-speed pumps — run through sensitive electronic controls. Those controls can be fussy about rough or unstable power, the kind a struggling or lower-quality generator can produce.

This is one reason inverter generators, which make especially clean and steady power, are gentle on sensitive equipment. If you have a constant-pressure or variable-speed system, clean power is worth caring about. Our guide on those systems, and our inverter-vs-conventional generator notes, go deeper.

✓ Know which pump you have

If you have a newer constant-pressure or variable-speed system, its electronics prefer clean, steady power. A simple older pump is more forgiving. Either way, steady power is best.

Enough power — why an undersized generator hurts

It is not just about whether the generator can start the pump — it is about not straining it.

When a generator is too small for the load, its voltage can sag — a brownout. Running a motor on low voltage makes it draw more current and run hot, which is hard on the windings over time. A pump asked to start and run on a straining generator is not getting the kind of power it deserves, even if it limps along.

The fix is simple: size the generator with enough capacity and surge headroom so it never has to strain, even at the pump's startup. That protects the pump and keeps everything running smoothly. Our sizing guide covers how to get there, and it is worth getting right.

! A straining generator strains the pump

Do not run your pump on a generator that bogs down or sags at startup. Low voltage runs a motor hot and shortens its life. Right-size the generator so it never has to struggle.

Gentle starts — letting the generator settle

How you start the pump on a generator makes a real difference to both machines.

When you fire up a generator, give it a moment to settle into a steady rhythm before you put the pump's big startup demand on it. Starting the pump the instant the generator coughs to life — while it is still finding its feet — is rough on everything. A few seconds of patience smooths it out.

Likewise, give the pump a clear runway: turn off other big loads so the generator can devote itself to the pump's startup surge, then bring other things back once the pump is running. Our game-plan guide covers this sequence, and it protects the pump every time.

✓ Let it settle, then start the pump

Start the generator, let it run steady for a few seconds, clear other big loads, then switch on the pump. That small routine is gentle on both the generator and the pump.

How a soft starter protects the pump

The same device that helps a generator start a pump also protects the pump itself.

A soft starter eases the pump motor up to speed over a second or two instead of slamming it to full speed instantly. That gentler start is not only easier on the generator — it is easier on the pump. Less mechanical shock and a smaller electrical jolt at startup can mean less wear over the years.

So a soft starter does double duty: it can let a smaller generator run your pump, and it treats the pump more kindly every time it starts. For a hard-working well pump, that gentleness adds up. Our soft-starter guide explains it fully.

✓ Gentler on the pump, too

A soft starter is often talked about for helping generators, but its gentle-start benefit is good for the pump's longevity as well. A worthwhile addition on many wells.

Surges and lightning — a real rural threat

Out in the country, this is one of the biggest dangers to a pump and its controls. It is worth guarding against.

Long rural power lines and open country make lightning and power surges a genuine risk. A nearby strike or a surge when power is restored can damage a pump's controls — especially the electronics in constant-pressure and variable-speed systems. It is a common and expensive way for a pump to fail.

Surge protection helps. A whole-home surge protector at the panel, and sometimes dedicated protection at the pump's controls, can absorb many spikes before they reach sensitive parts. This is electrician territory, but it is a modest, worthwhile safeguard for a rural well home, where surges are more likely.

! Guard the controls against surges

If you have sensitive pump electronics and live where lightning is common — which is most of the country — ask your electrician about surge protection. It is far cheaper than a damaged pump controller.

Never let the pump run dry

A pump running with no water to move is one of the surest ways to ruin it. Here is what to know.

Most well pumps rely on the water around them to keep cool and lubricated. If the water level in the well drops below the pump — in a drought, a heavy-use spell, or a well problem — the pump can run dry, overheat, and burn out. This is a real risk if you are running the pump hard on backup power during a long outage.

Many systems have a low-water cutoff that shuts the pump off before it runs dry; if yours does not, your well pro can often add one. During an outage, do not run the pump continuously trying to fill everything at once — run it in sessions and let the well recover. Our game-plan guide covers that rhythm.

! Dry running kills pumps

If your water suddenly runs weak or the pump seems to run without delivering water, stop and have it checked. Running a pump dry can destroy it quickly.

Fix short-cycling promptly

We meet this again from the pressure-tank guide, because it is one of the biggest pump-wearers there is.

When a pump clicks on and off rapidly — short-cycling — it is starting far more often than it should, and every start is a moment of stress. A pump that short-cycles for months is a pump wearing out early. The usual cause is a pressure tank that has lost its air cushion or a failed bladder.

The fix is usually straightforward for a well pro — recharge the tank's air or replace a tired tank — and it pays for itself in pump life. If you notice rapid clicking whenever water runs, do not ignore it. Our pressure-tank guide explains the why.

✓ Rapid clicking is a fixable warning

Short-cycling is both a warning and a fixable one. Catching it early protects your pump from a lot of needless wear.

Two kinds of homes, two sets of needs

Protecting a pump is really a well-home concern, but the power-quality habits help any home's equipment.

If you live in town or the suburbs

In town or the suburbs on city water, you have no well pump to protect — but the same ideas apply to other motors and electronics you might run on a generator, like a furnace blower or a sump pump. Clean, sufficient power and surge protection are good for all of them.

- No well pump, but the clean-power and surge ideas still protect your electronics.
- A right-sized generator protects a furnace blower or sump pump the same way.
- Surge protection guards your home electronics against spikes too.
- You can skip the dry-run and pressure-tank concerns entirely.

If you are out in the country on a well

Out in the country on a well, this guide is squarely for you — your pump is a costly, hard-to-reach investment, and backup power is exactly when it needs the most protection.

- Give the pump clean, sufficient, gently started power on backup.
- Guard the controls against surges and lightning — a real rural threat.
- Never run the pump dry; run it in sessions during a long outage.
- Fix short-cycling promptly to spare the pump needless wear.

★ Well or city — kind power helps both

Whether it is a well pump or a furnace blower, gentle, sufficient power protects your equipment. Call me at (330) 200-8042 and we will make sure your backup setup is doing right by it.

Protecting the controls from the elements

The pump lives down the well, but its controls often live where the weather can reach them. They need looking after too.

- **Keep them dry** — pressure switches and control boxes dislike moisture; make sure covers and enclosures are intact.
- **Keep them from freezing** — controls in an unheated well house or pit can be damaged by deep cold; see our winter guide.
- **Keep the well cap sealed** — a proper, tight well cap keeps out water, insects, and critters that can cause trouble.
- **Keep them accessible** — know where your controls are so you can check them and reset a tripped switch if needed.

A quick look now and then — is the cover on, is anything corroded or wet, is the well cap tight — catches small problems before they become pump failures. It costs nothing but a minute of attention.

✓ A minute's look saves a big bill

Glancing at your pump's controls a couple of times a year — dry, covered, tight — is free insurance against a costly failure. Tie it to the clock change so you remember.

Checking the pump after a storm or surge

Lightning and outages come and go. A quick check afterward catches trouble early.

After a big storm, a nearby lightning strike, or the power coming back on, it is worth confirming your pump is working normally — water flows at a good pressure, the pump cycles as usual, and nothing smells hot or looks amiss at the controls. Surge damage sometimes shows up as a pump that will not start, or controls that behave oddly.

If something seems off, do not keep switching it on and off hoping it sorts itself out — that can make matters worse. Have your well or pump professional take a look. Catching surge or storm damage early can sometimes save the pump or limit the repair.

✓ A quick post-storm check

After a storm or a surge, run a tap and listen to the pump. Normal flow and normal cycling mean all is well. Anything odd is worth a pro's look, sooner rather than later.

Pump-friendly backup-power habits

Pulling it together, here are the habits that protect your pump every time you run it on backup.

- ❑ Use a right-sized generator with surge headroom — never one that strains.
- ❑ Let the generator settle before starting the pump, and clear other big loads first.
- ❑ Consider a soft starter for gentler starts and easier generator duty.
- ❑ Run the pump in sessions; do not run it dry chasing a full tank.
- ❑ Keep surge protection in place, especially for sensitive controls.
- ❑ Check the pump after storms and when power returns.

★ Let's make your setup pump-friendly

A backup setup that is kind to your pump is not hard to arrange — it is mostly good sizing and a few habits. Call or text (330) 200-8042 and we will review yours together.

A little regular care goes a long way

Beyond backup power, a few ordinary habits keep a pump healthy for the long haul.

Pay attention to changes: a drop in water pressure, air spitting from the taps, new noises, or a pump that runs longer than it used to. These are your pump's way of asking for attention, and noticing them early is worth a great deal. A yearly once-over from a well pro, if you use one, catches things you might miss.

Keep records, too — when the pump was installed, its horsepower and voltage, and any service done. That history helps any professional help you faster, and it means you have the pump's numbers ready when you plan backup power. Our sizing guide explains why those numbers matter.

✓ Notice the small changes

Your pump usually warns you before it fails — weaker pressure, odd sounds, longer runs. Noticing early turns a big emergency into a small, planned repair.

A few common myths, gently corrected

These come up around pump protection, and some can cost you a pump. Here is the honest version.

The myth	The honest truth
Any generator that starts the pump is fine.	A straining one runs it on low voltage — hard on the motor.
Pumps are rugged; power quality doesn't matter.	Modern controls are sensitive — clean, steady power protects them.
Lightning damage only hits electronics in town.	Rural lines are more exposed — surge protection matters most here.
A little short-cycling is harmless.	It wears the pump fast — fix it promptly.

! The 'any generator' myth is the costly one

A generator that barely starts your pump, straining and sagging, can shorten the pump's life. Right-size it so it never has to struggle.

What I can do — and what I bring in a pro for

Here is my honest role in protecting your pump.

- **What I do:** help you set up pump-friendly backup power, size the generator with headroom, weigh a soft starter, and build good habits — all at your pace.
- **A licensed electrician does** surge protection, wiring, and the backup-power hookup.
- **A well or pump professional** handles the pump itself, short-cycling, low-water cutoffs, and control repairs.

I am a patient tech helper with 30-plus years of experience, not a licensed electrician or well contractor — and I will always be clear about that line. What I bring is help making your backup setup kind to your pump, and lining up the right pro for the hands-on work.

★ Protecting your investment, together

A pump is a big investment worth protecting. Call or text (330) 200-8042 and I will help you set things up so it lasts.

The mistakes that catch people out

Most pump damage from backup power comes from a few avoidable slip-ups.

- **An undersized generator** that runs the pump on straining, low-voltage power.
- **Slamming the pump on** before the generator has settled, or with big loads already running.
- **No surge protection** on a rural home where lightning is a real threat.
- **Running the pump dry** during a long outage, chasing a full tank nonstop.
- **Ignoring short-cycling** until the pump wears out.

Our common-mistakes guide covers each in detail. Every one is avoidable with good sizing, gentle starts, and a little attention.

✓ Kind power avoids most of it

Right-size the generator, start gently, protect against surges, and run in sessions. Those few habits sidestep nearly all pump damage from backup power.

Questions worth asking the pros

A few good questions help you protect your pump for years.

Q: Is my generator big enough to run the pump without straining?

Ask your electrician or check against your pump's numbers. Headroom protects the motor from low-voltage strain.

Q: Do I have a low-water cutoff to prevent dry running?

Ask your well pro. If not, adding one can protect the pump during heavy use or a drought.

Q: Should I add surge protection for my pump controls?

On a rural home with sensitive controls, often yes. Your electrician can advise on panel and control protection.

Q: Is my pump short-cycling, and is the tank healthy?

Have a well pro check the pressure tank's air charge. A healthy tank protects the pump from needless starts.

✓ Ask before there's a problem

The best time to ask these is on a calm day, not after a failure. A little prevention is far cheaper than a pump replacement.

Common Questions

The questions I hear most about protecting a well pump.

Q: Can running my pump on a generator damage it?

It can, if the generator is undersized and runs it on low, straining voltage, or if you slam the pump on before the generator settles. Right-size it, start gently, and the pump is fine.

Q: Does clean power really matter for a well pump?

For a simple older pump, less so. For modern constant-pressure or variable-speed systems with electronic controls, clean, steady power protects those controls.

Q: How do I protect my pump from lightning?

Surge protection at the panel, and sometimes at the controls, installed by an electrician. On long rural lines, this is a real and worthwhile safeguard.

Q: What ruins a well pump fastest?

Running it dry and letting it short-cycle are two of the quickest. Both are avoidable — run in sessions, keep a low-water cutoff, and fix a short-cycling tank promptly.

★ Still have a question? That is what I am here for

There is no silly question. Call or text me at (330) 200-8042 and we will keep your pump healthy together.

A gentle word about cost

Protecting a pump is far cheaper than replacing one, which is the whole point of this page.

Most of what protects a pump is free or modest: good habits, gentle starts, running in sessions, and noticing changes. A soft starter, surge protection, or a low-water cutoff are small additions compared with the cost of pulling and replacing a pump from deep in a well — which is one of the bigger repairs a well home can face.

I do not sell pumps or parts and earn nothing on the work, so my advice is just honest advice about what keeps yours healthy. Spending a little on protection now is some of the best-value money in this whole category.

★ Prevention is the bargain

A few dollars of protection beats a big pump-replacement bill every time. My first visit is a flat \$99 with a 30-day come-back-free guarantee, and I will line up a well pro for the hands-on parts.

Bringing it all together

If this guide did its job, protecting your pump feels simple. Here it is in three lines.

- ❑ **Kind power:** clean, sufficient, and gently started — never a straining generator.
- ❑ **Guard against surges:** protect the controls, especially on a rural home.
- ❑ **Avoid the pump-killers:** never run dry, and fix short-cycling promptly.

Do those three things and your pump, and its controls, will serve you well for years — outage after outage. It is a costly investment, and it deserves that little bit of care.

★ And whenever you would like a hand

That is exactly what I do — come to your home, work at your pace, and never make you feel rushed or silly for asking. Call or text me at (330) 200-8042.

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 protecting your well pump and its controls 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

Kind Power vs. Rough Power

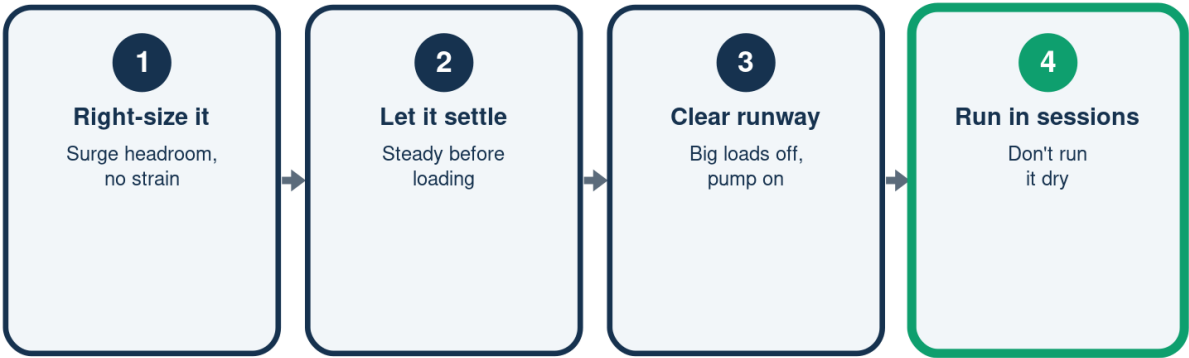
What keeps a pump healthy

	Kind power	Rough power
Voltage	Steady	Sagging / straining
Generator size	Headroom	Undersized
Startup	Gentle / soft	Slammed on
Pump life	Longer	Shortened

Clean, sufficient, gently started power protects the pump.

Pump-Friendly Backup Power

The gentle routine



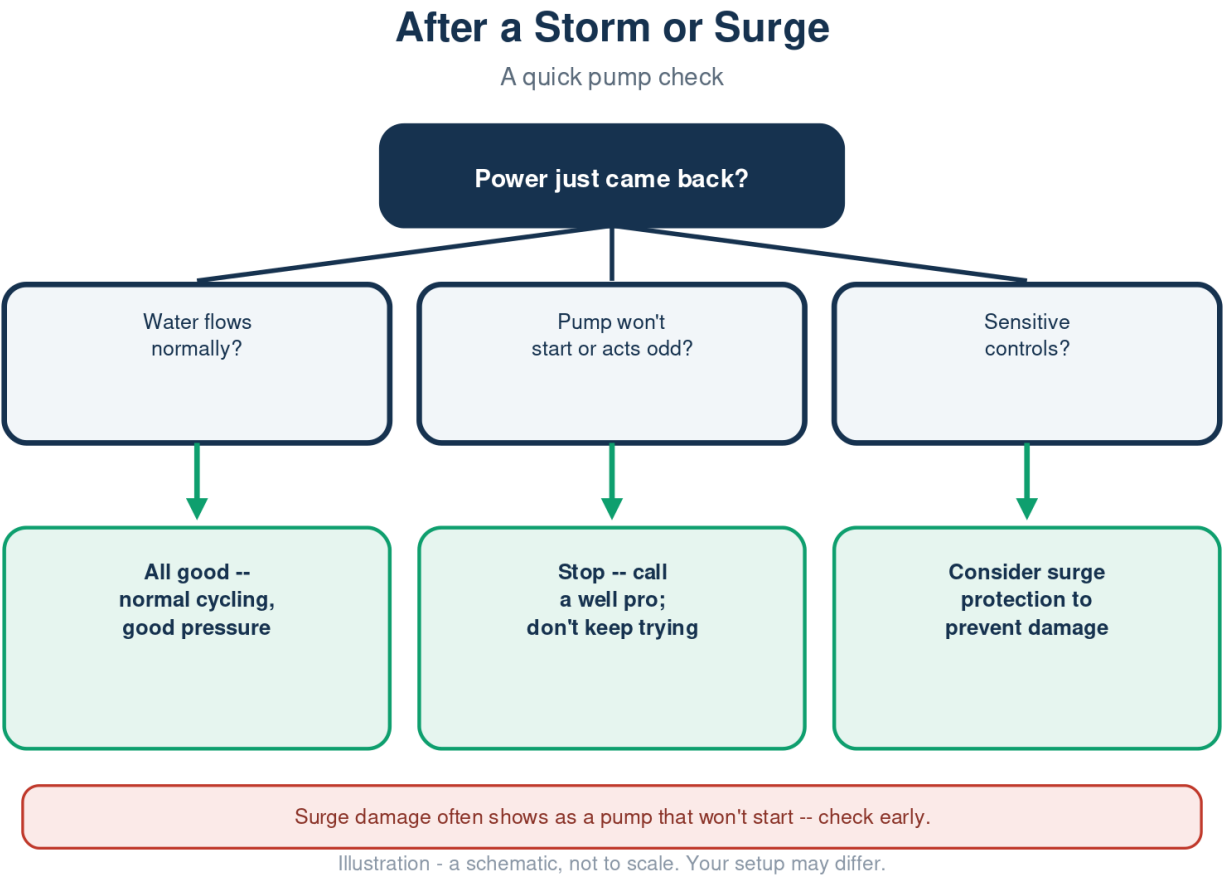
A few habits protect a costly pump.

The Pump-Killers to Avoid

And how to prevent each

	Killer	Prevention
Low voltage	Right-size the	generator
Running dry	Low-water cutoff,	sessions
Short-cycling	Fix the pressure	tank
Surges	Surge protection	at panel

All four are avoidable with a little care.





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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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