



An Extended Guide · No. 1275

Heat & Water on Backup Power: Furnace, Sump Pump & Water Heater

Furnace, sump pump & water heater

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! Before you begin — a quick safety note.

This guide covers work involving household electricity, gas heat, and engine exhaust, which can cause serious injury, fire, or property damage if something goes wrong. It's here for general information only, not professional advice. If you're not completely comfortable — or if your local codes require a licensed pro — please stop and hire a qualified licensed electrician or HVAC pro. Turn off the power at the breaker before any electrical step. Never work on gas lines yourself; if you smell gas, leave right away and call your gas company or 911. There's no shame in calling a pro — that's often the smart, safe choice. You follow this guide at your own risk. — Bill

A Note From Bill

A lot of folks are surprised to learn that “gas heat” doesn't mean the furnace keeps working when the power's out. It doesn't — and that surprise is exactly why this guide exists.

We'll walk through three systems that quietly matter more than almost anything else in a winter outage: the furnace or boiler, the sump pump, and the water heater. Take it at your own pace.

What you'll get out of this guide

- Why gas heat still needs electricity to actually work
- How a sump pump keeps your basement dry, and what it needs from a generator
- What's realistic to expect from a water heater on backup power
- How to prioritize and run all three without overloading
- Notes for town homes and for homes on a well

★ One surprise at a time

This guide untangles three systems that get confused with each other constantly. By the end, you'll know exactly which matters most for your home. Questions along the way? (330) 200-8042.

The Whole Idea in One Page

If you read only one page today, make it this one.

- ❑ Gas furnaces and boilers still need electricity for their blower, ignition, and controls. The flame is gas; the fan and the brains behind it aren't.
- ❑ A sump pump keeps your basement dry, and losing power during a storm is exactly when you need it most.
- ❑ Water heaters vary: gas tank models often need only a little power for controls; electric ones are a much bigger draw.
- ❑ These systems can usually run together on a properly sized generator, but their starting jolts add up — plan for the biggest one, not all of them at once.
- ❑ There's a whole guide on sizing in this series if you want the full worksheet.

✓ Test it before winter

The best time to learn whether your generator handles these systems is a calm afternoon, not the middle of an ice storm.

The Surprise: Gas Heat Still Needs Electricity

It's an easy assumption to make — the furnace runs on gas, so it should keep working no matter what. Unfortunately, that's not how it works.

- The **blower fan** that pushes warm air through your ducts is an electric motor.
- The **ignition system** that lights the burner runs on electricity too — most modern furnaces don't use an old-fashioned standing pilot light.
- The **thermostat and control board** that tell the whole system what to do run on electricity as well.

! No power, no heat — even with gas

A full propane tank or a working natural gas line doesn't help if the furnace can't power its blower and controls. This is the whole reason this guide exists.

Inside the Furnace Blower

The blower motor is usually the biggest electrical draw in a gas furnace, and like any motor, it has its own starting jolt.

- The blower motor pulls its biggest jolt of power for a second or two when it first kicks on — the same pattern as a fridge or pump motor.
- Once it's spinning, it settles into a steady draw for as long as the thermostat calls for heat.
- Blower size varies by home and duct system, so check your own furnace's data plate rather than assuming a number.

✓ This number feeds your worksheet

There's a dedicated sizing guide in this series with a simple worksheet — your furnace's running and starting watts are exactly the kind of number it asks for.

Boilers Are a Little Different

If your home has hot-water or steam heat instead of forced air, the electrical picture looks a little different — but the same basic surprise applies.

- A **circulator pump** moves hot water through the pipes to your radiators or baseboards, and it's electric.
- **Zone valves**, if your system has them, open and close electrically to control which areas get heat.
- Ignition and controls still run on electricity here too, just like a forced-air furnace.

If you have a boiler and you're not sure exactly what runs electrically, your HVAC pro can point out each component in a few minutes.

✓ Same idea, different parts

Whether it's a blower or a circulator pump, the lesson is the same: check the label, don't assume.

The Sump Pump: Your Basement's Best Friend

If your home has one, the sump pump quietly does one of the more important jobs in the house — and it only really shows its value the moment it stops working.

- It sits in a pit in the basement and pumps groundwater out and away before it can rise into your living space.
- It typically only runs when needed, kicking on as water rises in the pit and off again once it's pumped down.
- Storms that knock out power are very often the same storms pushing groundwater the hardest — which is exactly why this matters.

! This is a common way basements flood

Losing sump-pump power during a heavy storm is one of the more frequent causes of basement flooding. It deserves a real spot on your generator plan.

Sizing for the Sump Pump's Surge

Like any other motor, a sump pump has a starting jolt worth accounting for on its own.

- Check your own sump pump's nameplate for its running and starting watts, the same way you would for any other motor.
- Its starting jolt is usually smaller than a well pump's, but it's still worth including deliberately, not lumping in as an afterthought.
- A battery-backup sump pump, if you have one, doesn't need to be on the generator's worksheet at all — it runs on its own battery.

✓ The full worksheet method

There's a dedicated guide in this series with the complete sizing worksheet, if the sump pump is one part of a bigger household picture.

What About the Water Heater?

This is the one where expectations matter most — the honest answer depends heavily on what kind you have.

- **Gas water heater (standard tank):** often needs only a small amount of power for its controls and, on some models, an igniter — a modest draw.
- **Electric water heater:** a much bigger draw, since it heats water directly with electric elements. Running one alongside everything else is a real stretch for most portable generators.
- **Tankless water heater** (gas or electric): both need power for controls and ignition; electric tankless units draw especially heavily.

! Set expectations honestly

Hot showers on generator power are often a stretch, especially with electric water heating. Check your own unit's label and manual, and ask your plumber or HVAC pro if you're unsure what to expect.

Setting Your Priorities: Heat, Dry Basement, Hot Water

With three systems in play, it helps to know which one to protect first if your generator is stretched thin.

- In cold months, **heat** usually comes first — a cold house risks frozen pipes and real discomfort fast.
- A flooded basement gets worse the longer it goes unaddressed, so the **sump pump** is rarely something worth skipping either.
- **Hot water** is genuinely nice to have, but it's often the first thing worth doing without or rationing if the generator can't comfortably cover all three.

✓ Your household, your order

This is a common-sense starting order, not a rule. Adjust it for your own home and season.

Running Them Together Without Overloading

The same “take turns” habit that applies to the rest of your home works well for these three systems too.

- Let the furnace blower and sump pump act as your steady essentials, cycling on their own automatically as needed.
- If you're also running an electric water heater or something similar, treat it as a “take turns” item rather than something running constantly alongside the other two.
- Try not to trigger a big appliance's start — a well pump elsewhere in the house, say — at the exact same moment the furnace blower or sump pump kicks on.

✓ More on load rotation

There's a whole guide in this series on running your home's essentials and rotating big loads day to day, if you'd like the fuller picture.

If You Live in Town or the Suburbs

For most town and suburban basements, one of these three systems tends to matter most.

- The **sump pump** is usually the single biggest water worry, especially during heavy rain.
- Combined with the furnace blower, these two systems cover most of what a town household really needs from backup power for heat and water.
- Natural gas, if your home has it, can make the furnace itself hands-off fuel-wise, leaving the generator to focus on the blower and sump pump's electrical needs.
- Water heaters here are often gas-fired, which keeps their generator draw modest.

✓ On a private well in town?

If your town or suburban home still draws from a private well, there's a dedicated guide in this series on backing up a well pump — read that one as your priority list too.

If You're Rural or on a Well

Out in the country, the furnace blower usually shares top billing with one more system this guide only touches on briefly: the well pump.

- The well pump typically joins the furnace blower on the priority list — and it usually carries the far bigger starting surge of the two.
- A sump pump is less universal on rural properties, depending on your basement and local water table, but plenty of country homes have one too.
- Rural outages tend to run longer, so the furnace blower and any pump on the property need to hold up for days, not just hours.

Because the well pump usually deserves top billing on a rural generator plan, there's a whole dedicated guide in this series just on backing it up — well worth reading alongside this one.

★ Heat, water, and the well — together

Rural households often ask me to plan for all of this at once. It's very doable — it just takes a clear-eyed look at what actually matters most for your place.

The One Rule That Matters Most

Everything else in this guide is about keeping heat and water going. This page is about coming home to your family safe.

A running generator gives off **carbon monoxide**, or CO. It's **invisible**, has **no smell**, and can make you pass out or worse before you ever realize anything is wrong.

- Run the generator **outdoors only**, at least **20 feet** from the house, exhaust pointed away from doors and windows.
- **Never** in a garage, basement, shed, or carport — not even with the door open.
- Put **battery-backup CO alarms** on every floor, near the bedrooms, and test them.
- If an alarm sounds, or anyone feels dizzy, headachy, or sick, get everyone **outside into fresh air** right away and call 911.

! Two different dangers, both real

Your furnace's own combustion exhaust and your generator's exhaust are separate concerns — keep both vented properly and keep the generator outdoors, always.

A Word on Gas Safety

The furnace and water heater both involve a gas line separate from your generator's own fuel, so a couple of extra habits are worth knowing.

- Know where your home's main gas shutoff is, just in case.
- If you ever smell gas — a rotten-egg smell added on purpose — don't flip switches or light anything. Get away from the area and call your gas company or 911 from a safe distance.
- Keep your generator's own fuel supply and connections separate and clearly apart from your home's gas appliances.

! When in doubt, get out first

A gas smell is never something to investigate yourself. Leave the area, then call for help.

Getting Connected Safely

The furnace/boiler and sump pump are usually built-in circuits, which changes how you'll want to connect them.

- A **transfer switch or interlock**, installed by a licensed electrician, lets these built-in systems switch over cleanly and keep cycling automatically.
- Cords can work for a portable sump pump or a water heater's controls in a pinch, but a furnace blower is normally hard-wired, not something you'd run off an extension cord.

! Never a wall outlet

Backfeeding through a regular wall outlet to power these systems can electrocute a utility lineworker. There's a whole guide in this series on transfer switches and interlocks.

A Second Layer: Battery Backup Sump Pumps

Some homes add an extra layer of protection for the basement, separate from the generator entirely.

- A battery-backup sump pump kicks in automatically if the primary pump loses power, with no generator required.
- It's a nice complement to a generator, especially for the gap before the generator gets started, but it's usually not a replacement for one when it comes to everything else in the house.
- A plumber familiar with sump systems can tell you whether one makes sense for your basement.

✓ Belt and suspenders

For a basement that's flooded before, a battery backup pump plus a generator is a reasonable, low-drama way to sleep easier during storms.

Cold Weather and These Systems

Ohio winters have a way of testing every part of this setup at the same time.

- Propane has to vaporize to feed the engine, and that process slows down in deep cold, especially in a small or nearly empty tank.
- Keeping the furnace running matters even more in freezing weather, both for comfort and for helping protect pipes from freezing.
- A larger propane tank, kept fairly full, performs more reliably on a bitter night than a small, low one.

✓ There's a whole guide on this

Cold-weather propane gets its own dedicated guide in this series if freezing outages are a regular concern for your home.

The Mistakes I See Most Often

A handful of avoidable slip-ups account for most of the heat-and-water surprises I see.

- Assuming “gas heat” means the furnace will work without electricity.
- Forgetting the sump pump's own starting jolt when sizing.
- Expecting a standard portable generator to comfortably run a full electric water heater alongside everything else.
- Wiring a furnace or sump pump circuit without a licensed electrician.
- Never actually testing the sump pump on generator power until an actual storm arrives.

! Test before you need it

A calm, dry afternoon is a much better time to find a gap in this plan than the middle of a storm.

Ready Before Winter Hits

A little upkeep now means these three systems actually work together when a storm finally arrives.

- Run the generator monthly with a little load on it, so it stays limber and, on electric-start models, keeps its battery charged.
- A good yearly habit: test the furnace blower and sump pump specifically on generator power before winter storms arrive, not during one.
- Change the oil on the schedule in your manual — clean oil is inexpensive insurance.

★ An easy yearly once-over

Once a year I'm glad to stop by, test the whole setup — furnace blower, sump pump, and all — and make sure it'll perform when you actually need it.

When to Give Me a Call

You can absolutely learn and manage all of this yourself — that's what this guide is for. But a few parts are easier and safer to hand off.

- Sorting out which of these three systems matters most for your home.
- Sizing a generator that covers the furnace blower and sump pump together.
- Setting realistic expectations for your specific water heater.
- Coordinating a licensed electrician for a transfer switch or interlock.
- A yearly test-run before heating season, so nothing surprises you.

I come to you, here in Portage County and nearby, and explain everything in plain language at whatever pace suits you.

★ Bill's Home Tech

Call or text (330) 200-8042. Tech Made Simple, Service Made Personal. Every visit is \$99 flat and 30-day come-back-free — if you're not happy, I'll make it right.

Everyday Cheat Sheet

Dog-ear this page or copy it onto a card. It's the quick answer to the things that come up most.

I want to...	Remember this
Understand gas heat	The flame is gas, but the blower, igniter, and controls are electric.
Protect the basement	Check your sump pump's own running & starting watts; consider a battery backup too.
Set water heater hopes right	Gas tank models sip power; electric and tankless models draw much more.
Prioritize	Heat first in cold months, then a dry basement, then hot water.
Run it all together	Let the biggest single starting jolt set your target, not all of them added up.
Stay safe from CO & gas	Generator outdoors only; know your gas shutoff; never investigate a gas smell yourself.
Get help	Call Bill: (330) 200-8042.

Words People Use

A few terms you may hear around heat and water backup, in everyday language.

Q: Blower motor

The electric fan inside a furnace that pushes warm air through the ductwork.

Q: Circulator pump

The electric pump in a boiler system that moves hot water to radiators or baseboards.

Q: Zone valve

An electrically controlled valve that directs heat to specific areas in some boiler systems.

Q: Sump pump

A pump in a basement pit that moves groundwater out and away before it can flood the space.

Q: Battery backup sump pump

A second pump that runs on its own battery, independent of the generator, if the main pump loses power.

Q: Starting (surge) watts

The extra burst a motor needs for a moment when it first turns on.

Q: Transfer switch / Interlock

The safe, electrician-installed way to feed built-in circuits like a furnace or sump pump from a generator.

Q: Carbon monoxide (CO)

The invisible, odorless gas in engine exhaust that can kill. The reason a generator must always run far outdoors.

Heat & Water Priority Order

A sensible order when a generator is stretched thin

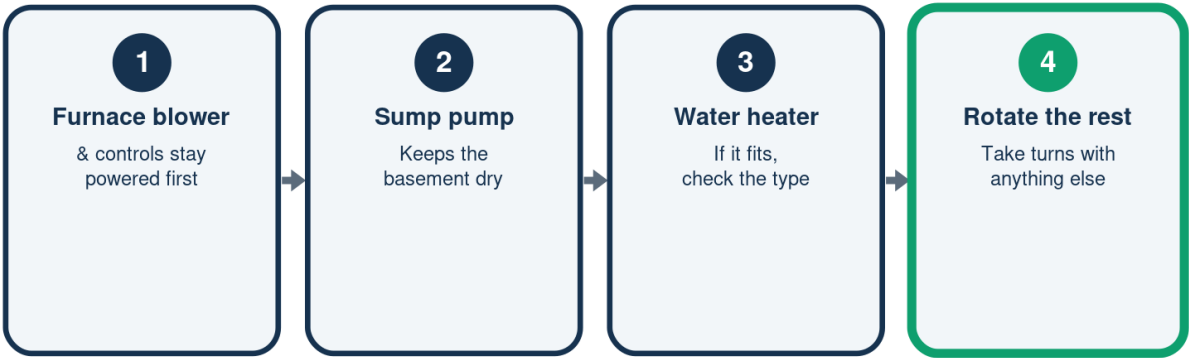


Illustration - a schematic, not to scale. Your setup may differ.

Three Systems, Side by Side

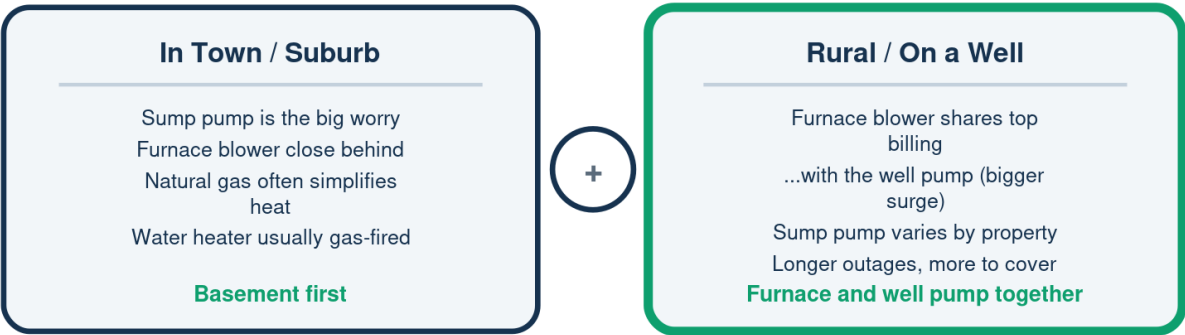
What each one needs, and why it matters

	Furnace/Boiler	Sump Pump	Water Heater
Runs on power for	Blower, controls	Its motor	Controls, heat
If power's out	No heat at all	Basement floods	No hot water
Priority	High in winter	High in storms	Often last

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

Town Priorities vs. Country Priorities

Same three systems, a different one leads the list

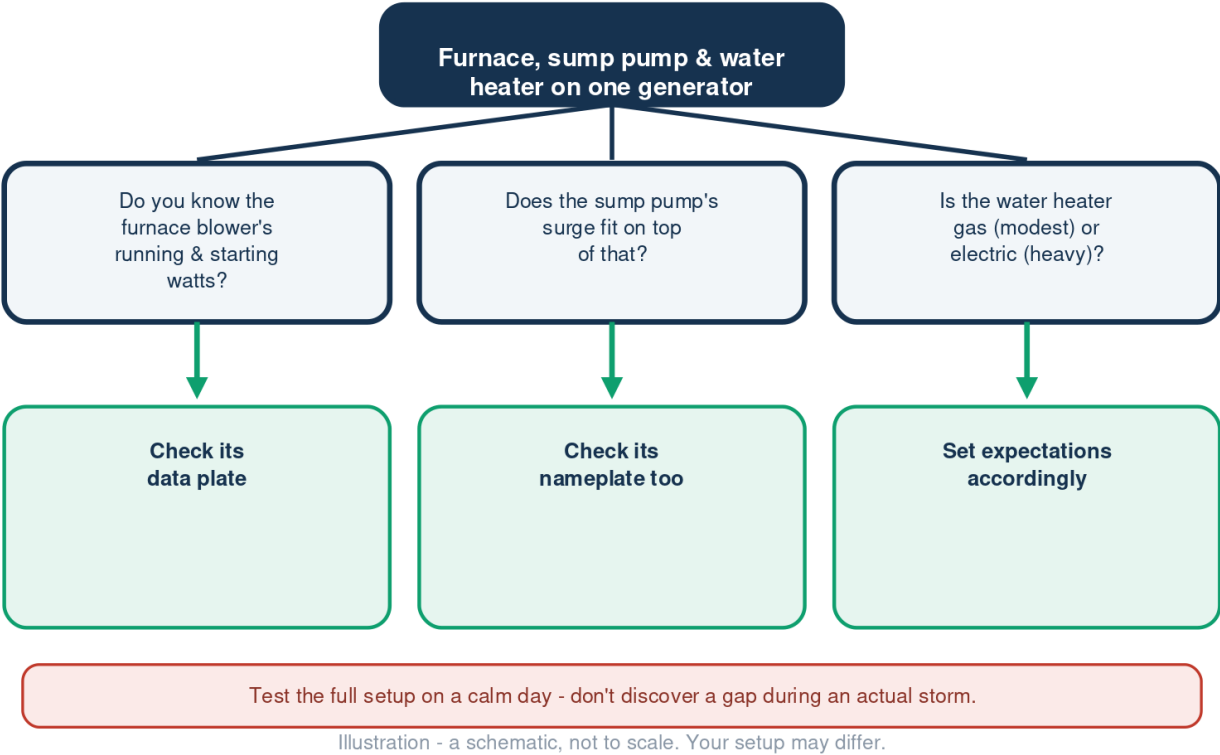


Read the well-pump guide too if you're on one

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

Will These Fit Your Generator?

Three quick checks before you count on it





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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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