

KEEP YOUR GAS FURNACE RUNNING WHEN THE POWER GOES OUT

Why the furnace quits, the transfer switch that fixes it, the watt math, and the safety rules that keep the fix from killing someone.

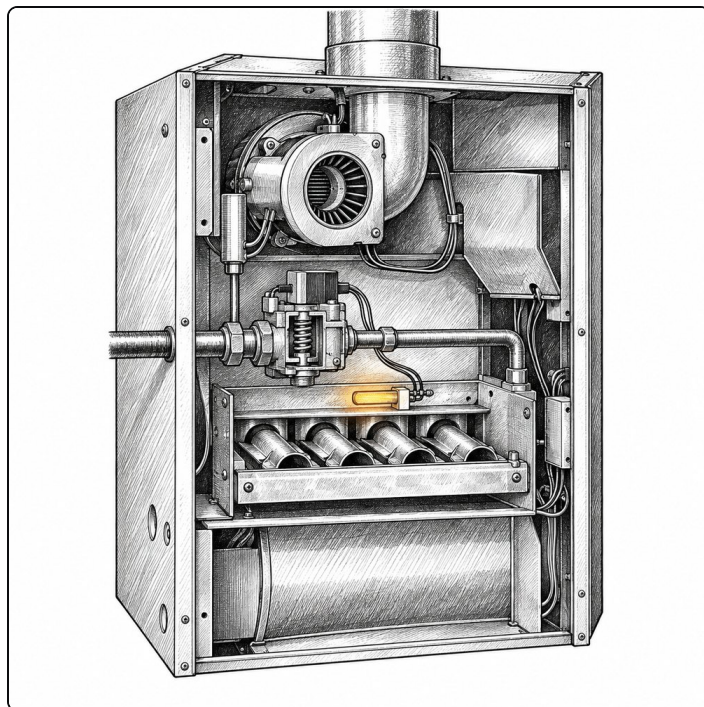
In a blackout, a modern gas furnace can't heat your house without electricity, even when gas is available. The fix is a furnace transfer switch, a small box of about 110 to 140 dollars that an electrician wires in beside the furnace. Plug a compatible generator or power station into it, and the furnace can run through that switch.

WHY A GAS FURNACE NEEDS POWER

- 1 The control board is already powered, waiting for the thermostat. A small transformer drops your 120 volts to 24 for the controls.
- 2 The draft inducer fan starts, pulling air through the burners and pushing exhaust up the flue.
- 3 A pressure switch has to prove that fan is really moving air, or the board goes no further.
- 4 The igniter heats up. On many modern furnaces it's a ceramic bar that glows orange hot, like a stove element.
- 5 Only then does the board open the gas valve. **A spring holds that valve shut.** In a common design, a 24 volt signal from the board opens it.
- 6 About 30 seconds after the flame lights, the blower pushes warm air through your ducts.

No power, no valve. Without electricity the valve stays closed. Gas may still be in the pipe, but storms can interrupt that supply too.

The exception: some old wall and floor furnaces run their controls off the pilot flame and heat without a blower, so they keep working. If you have ducts and a blower, you're in the group that goes cold.



Inducer, burners, a glowing igniter, and a gas valve held shut by a spring.

THE TRANSFER SWITCH

- ☐ A small box on the wall next to the furnace. A common one is the Reliance Easy Tran, about 110 to 140 dollars.
- ☐ An electrician wires it between your breaker panel and the furnace. Most furnaces are hard wired, with no plug to pull.
- ☐ The front has one switch and a built in plug called an inlet. Your generator cord plugs in there.
- ☐ **Line:** the furnace runs off your panel like always. **Generator:** the furnace is fed from the inlet instead.
- ☐ It breaks the grid side before it connects the generator side, so your generator can't push power out to the street through that circuit.
- ☐ Comes in 15 and 20 amp versions. Your electrician matches it to the furnace circuit and checks startup surge, not just running watts.
- ☐ Want to plug in from outside? Ask for a weatherproof inlet on an outside wall, wired to the switch inside.

200 to 500

Dollars of labor for a simple install, plus a permit where your town requires one. All in, budget several hundred dollars before the generator, and get a local quote.

WHAT A FURNACE DRAWS

500 to 900	Watts for an older blower motor alone, roughly, depending on its size and speed.
about 200 W	A newer variable speed blower can idle along near this.
500 W	The example furnace used in the video. A running furnace usually draws several hundred watts. Larger furnaces can need more, so check yours.
250 W	Average draw if that 500 watt furnace runs half the time on a cold night, plus standby use.
Several x	The blower's startup surge can be several times its running draw. Size for the running load and the surge, never from the average alone.

YOUR WORKSHEET

1. Running watts (ask your electrician): _____ W

2. Startup surge (have your electrician check it): _____ W

3. Fraction of the time it runs (half = 0.5): _____

Average watts = running watts x fraction of time running

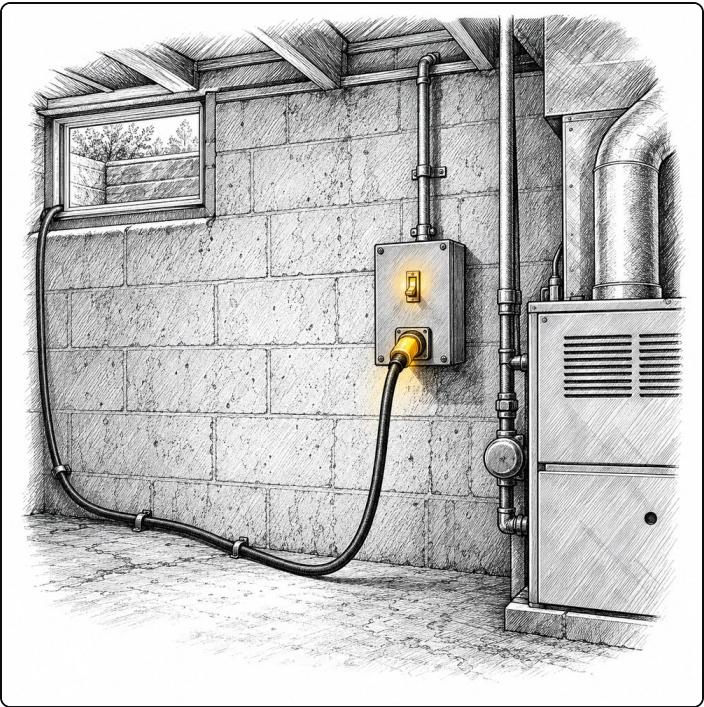
Example: 500 W x 0.5 = 250 W average. Yours: _____ W

Battery hours = usable watt hours ÷ average watts

Example: about 870 usable Wh ÷ 250 W = about 3.5 hours.

Yours: _____ hours

Your backup must cover line 1 and line 2 at the same time the furnace starts. The average only tells you how long the fuel or battery lasts.



The switch on the wall beside the furnace, the cord plugged into its inlet.

TWO WAYS TO SUPPLY IT

	Inverter generator	Battery power station
Example	Honda 2200: 1,800 running watts, lists for about 1,200 dollars. Cheaper inverter brands cost a lot less.	EcoFlow Delta 2: about 1,000 watt hours, 1,800 watt inverter. Stations this size cost several hundred dollars.
Runtime	About 8 hours at a light load on a tank just under a gallon. A long winter night will still take a second tank.	Plan on about 870 usable watt hours after conversion losses, an estimate. At 250 W that's about 3.5 hours, not a whole night.
Notes	Inverter output is clean and steady. Some furnace boards fault on rougher power. Whatever you buy must meet your furnace maker's power requirements.	No exhaust at all. A generator can refill a unit like this in about 80 minutes. A larger station stretches the hours.

Best as a pair: the generator runs and recharges, the battery covers the quiet hours.

THE CORD SPEC

- ☐ A grounded 12 gauge outdoor extension cord, 25 to 50 feet long.
- ☐ Plugs that match both the generator and the switch's inlet.
- ☐ Never a thin indoor cord. An undersized cord can overheat and drop voltage, especially when the blower motor starts.

THE SWITCHING SEQUENCE

- 1 Leave the transfer switch on line.
- 2 Connect the cord to the generator and to the inlet.
- 3 Start the generator **outdoors**, at least 20 feet from the house.
- 4 Let it run and settle for a moment.
- 5 Flip the transfer switch to **generator**.
- 6 Turn the thermostat up and listen for the furnace to fire.

MILD DAY TEST, IN OCTOBER

- ☐ Pick a mild fall day, not the night of the storm.
- ☐ Run the full sequence above with the backup you'd really use.
- ☐ Confirm the inducer, igniter, flame, and blower all come on.
- ☐ Some furnaces refuse to light on a generator or power station because of grounding or polarity. If yours does, have your electrician check grounding, polarity, and the switch's neutral arrangement.
- ☐ Test your carbon monoxide alarms the same day.



Out in the yard, far from the house, exhaust drifting away from every window and door.

SAFETY RULES. NOT OPTIONAL.

- ☐ **Never use a double male cord** (the "suicide cord") to plug a generator into a wall outlet. Your house connects to a utility transformer that works both ways. Backfeed can energize the utility line at dangerous voltage and kill a lineman, even from a small generator.
- ☐ Flipping the main breaker off first doesn't make that cord safe. The loose plug on the far end has live prongs the second the generator starts. The electrical code doesn't accept it.
- ☐ The approved whole panel version is an interlock kit: a plate that keeps the main and generator breakers from both being on. It needs a proper inlet and a local sign off.
- ☐ **Generator outdoors only.** A garage with the door open still counts as indoors.
- ☐ At least **20 feet** from the house, exhaust pointed away from windows, doors, and vents.
- ☐ Generator exhaust kills nearly 100 Americans a year. During Winter Storm Uri, generators were tied to at least 10 Texas deaths.
- ☐ Battery powered carbon monoxide alarms (or battery backup) on **every level** and **outside the bedrooms**. Test them before you ever pull the cord.
- ☐ **Shut the generator off and let it cool** before you refuel.

NO BACKUP AT ALL?

Stop heating the house. Heat the people.

- ☐ Pick one small room everyone fits in, and close the door. Close off unused rooms.
- ☐ Hang blankets over the windows. Lay a towel along the bottom of the door.
- ☐ Get everyone inside it. Keep necessary ventilation clear.
- ☐ Never use the oven or a camp stove for heat.
- ☐ If the room keeps getting colder, don't wait it out. Go to a warming center, or to someone who still has heat.

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Deaths across 77 Texas counties after Winter Storm Uri in February 2021, close to two thirds from hypothermia, when about four and a half million homes and businesses lost power.

Watch the full video: youtube.com/@SketchySurvival101

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Subscribe so the next blackout does not catch you flat footed.