



Whole-Home Standby Generators: How to Choose, Install, and Live With One

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A plain-language guide to whole-home standby generators: when you need one, natural gas versus propane versus diesel, how big in kilowatts, what an automatic transfer switch does, buy versus lease, and what the first year of ownership is really like.

The lights go out. The fridge warms up. The sump pump sits still. A portable generator in the garage can help, but someone has to drag it outside, keep it far from windows, and feed it gasoline in the dark. A whole-home standby generator is a different product. It stays outside on a pad. When utility power drops, it starts by itself and feeds the house through a transfer switch. When the utility comes back, it shuts down. You do not pull a cord.

This paper walks that choice from the need, through the decision, through the install, and into the years you live with the machine. It is a buying guide, not a permit, and not a substitute for the installer or the local inspector.

When a standby unit is the right tool

Start with the outages you actually get. A house that loses power for an hour twice a year may not need a permanent set. A house on a well, with a sump pump, a medical device, or a week of ice and wind, often does.

A standby set is worth a hard look when three things are true at once.

- You want power without going outside in a storm.
- The loads matter for more than phone charging: heat or cooling, a well or sump, a refrigerator, or a device that must stay on.

- You can put a machine on a pad with a legal fuel line and a clear path for exhaust.

It is the wrong tool if you only need a few outlets for a night. A small battery or a carefully used portable unit can cover that, and it costs less. It is also the wrong tool if you need power with zero gap. A standby set takes several seconds to start and come up to speed. Clocks reset. Computers reboot. A CPAP, oxygen machine, or home medical device that cannot blink needs its own battery in front of the generator. The generator refills that battery. It does not replace it.

Square footage is a weak reason by itself. Two houses of the same size can need very different machines. Gas heat and city water are an easier job than an electric heat pump, a well pump, and a large air conditioner.

What you are actually buying

The product is a system, not a box.

- The generator: an engine in a weather enclosure, sized in kilowatts (kW).
- The automatic transfer switch (ATS): the brain that watches the utility, starts the set, and moves the house from one source to the other.
- The fuel path: a natural gas line, a propane tank and regulator, or a diesel tank.
- The pad, the permits, and the electrician's work to land it on your panel.

Air-cooled home sets from the big makers commonly run from about 10 kW into the high 20s kW. Larger homes, two air conditioners, or long run times often step up to a liquid-cooled set. Liquid-cooled machines cost more, last longer under heavy use, and take more room.

Generac publishes a home sizing guide and sells air-cooled standby sets from 10 kW to 28 kW:

<https://www.generac.com/resources/home-management/what-size-generator-do-i-need/>

Cummins sells the QuietConnect home series, natural gas or propane, with a matching transfer switch and load management: <https://www.cummins.com/en-na/na/generators/home-standby/quietconnect-series>

Kohler's home generator business now operates as Rehlko. Home energy product pages are still on the Kohler power site: <https://www.kohlerpower.com/>

Read the spec sheet for the exact model, not the brochure headline. The sheet lists kW on natural gas and on propane (they are often different), noise at a stated distance, fuel use at half and full load, and the warranty hours. Those four lines decide more than the paint color.

How big: kilowatts, not wishful thinking

A kilowatt is 1,000 watts. A 22 kW set can supply about 22,000 watts while it is running inside its rating. That is not the same as "every appliance at once, including the surge when a motor starts."

Motors lie to a casual list. A central air conditioner may run on a few kilowatts and still demand a short burst several times larger to start the compressor. A well pump does the same. If the generator sags, lights dim, the motor stalls, and the breaker or the controller trips.

A useful home list has two columns.

1. Running watts: what the device uses once it is on. Fridge, lights, Wi-Fi, furnace blower, and a few outlets are the everyday column.
2. Starting watts: the burst. Usually the air conditioner, the well, or the sump is the biggest burst in the house.

You do not add every starting burst together unless those motors really start at the same second. You do have to cover the biggest one while the rest of the house is already on.

Load management is the honest way to buy a smaller set. A controller or a load-shed device pauses the dryer, the range, or the second air conditioner when the generator is near its limit, then brings them back. Generac, Cummins, and Kohler/Rehko all sell some form of this. It is not a trick. It is how a mid-size set can cover a whole panel without being sized for a fantasy peak.

Rough frames, not a bid:

- Essential circuits only (fridge, lights, furnace or a small heat source, a few outlets, maybe a sump): often a smaller air-cooled set, around the low teens of kW, if the air conditioner is left off or managed.
- A typical house that wants one central air conditioner and the kitchen, but not every large load at once: often the high teens to low 20s of kW, with load management.
- A large all-electric house, two air conditioners, a well, and an EV charger you insist on using during the outage: look at the top of the air-cooled range or a liquid-cooled set, and plan to shed the car charger first. Charging a car and running a house on one small engine is a bad match.

Have a dealer or an electrician do a load study on your panel. A free “what size” quiz on a website is a start. The nameplate on your air conditioner is the real input.

Fuel: natural gas, propane, or diesel

Pick the fuel before you fall in love with a model. The same engine is often sold in a natural gas / propane version. Diesel is usually a different, larger machine.

Natural gas

- The utility pipe feeds the set. You do not store fuel, and you do not run out in a three-day outage if the gas stays on.
- The same engine often makes a little less power on natural gas than on propane. Size to the natural gas number if that is your fuel.
- The gas meter and the pipe must be big enough at full load. A set that starts fine and stumbles when the air conditioner kicks on is often starved for gas, not “broken.”
- If an earthquake, flood, or utility shutoff kills the gas, the generator is just a quiet box. You have no backup fuel.

Propane (LP)

- An on-site tank is yours. The generator can run when the natural gas system is down.
- You must keep the tank filled before storm season. A mid-size air-cooled set burns several gallons an hour at full load. A few hundred gallons sounds like a lot until the set runs all weekend.
- Cold weather lowers tank pressure. A tank that is fine in July can struggle in a deep freeze if it is small or low. Ask the propane company, not a neighbor's guess.
- The tank, the regulator, and the line are part of the price. A long run from a buried tank to the pad is real money.

Diesel

- More common on liquid-cooled sets for larger homes and small commercial buildings. Strong motor-starting and a simple stored fuel.
- Diesel ages. Water and microbes in a tank that sits for years will clog filters the one week you need the set. A maintenance plan (filters, water drain, fuel treatment) is part of owning it.
- In a hard cold snap, diesel can thicken. Cold-weather kits and the right fuel blend matter.
- The install is heavier: tank, spill rules in some counties, and more noise and bulk than a small air-cooled gas set.

There is no universal winner. City and suburb houses with reliable gas service usually land on natural gas. Rural houses, or any house that has already lost gas in a past storm, usually land on propane. Diesel shows up when the load is large or the owner already keeps diesel equipment.

The automatic transfer switch

The transfer switch is why a standby set is legal and why a cord through a window is not.

When utility voltage fails, the switch tells the generator to start. It waits until the generator is making steady power. Then it disconnects your house from the utility and connects it to the generator. That open gap is the point. Generator power must not flow backward onto a line where a crew is working. When utility power has been stable again for a short time, the switch moves the house back and lets the engine cool down.

Most home jobs use an automatic switch, not a manual one. You can be asleep or away. A manual switch is cheaper and still needs a person.

Two details to ask about in writing:

- Is the switch service-entrance rated, or does it sit downstream of your main breaker? That choice changes the panel work and the permit.
- Does load shedding live in the switch, in separate modules at the big appliances, or both?

National Electrical Code Article 702 is the homeowner-relevant chapter for optional standby systems. Article 445 covers generators as equipment. Your city or county adopts a code edition and may amend it. The inspector enforces that edition, not a blog and not this paper. A plain entry point is the NFPA 70 development page: <https://www.nfpa.org/codes-and-standards/nfpa-70-standard-development/70>

Buy it or lease it

Owning

- You pay for the machine, the switch, the pad, the fuel work, the permit, and the labor, usually as one contractor bid.
- You own the set. If you sell the house, it conveys like a furnace, unless a loan says otherwise.
- You pay for oil, filters, and a dealer visit on the schedule in the manual. Warranty length is on the spec sheet and almost always requires a licensed install. Skipping that visit can void the warranty.
- Ask for the bid in lines: generator, transfer switch, electrical, gas or propane, pad, permit fees, and tax. A single round number hides which part is expensive at your house.

Leasing or a monthly plan

- A dealer or a finance company keeps the title. You pay every month. Service is often bundled, which is the real product: they exercise it, they fix it, you do not shop for a tech at 9 p.m.
 - Read the end of the term. Some plans let you buy the set. Some take it away. Some roll you into a new contract.
 - Read what happens if you move. An early-exit fee can erase the “low monthly” story.
 - A lease can be the right call if cash for a full install is the blocker and the outage risk is real. Over five to seven years, adding the payments often costs more than buying. Put both numbers on one sheet before you sign.
- Either way, get the model number, the fuel rating, the noise number, and the service schedule in the packet you keep. A handshake “about a 22” is not a spec.

Buying and installing without drama

This is not a weekend project. The engine is the easy part. The dangerous part is the connection to your panel and the exhaust near your family.

A normal path looks like this.

1. Make the load list and pick fuel. Call the gas utility or the propane company early. Meter and pipe upgrades can take longer than the generator delivery.
2. Get two or three bids from dealers who install, not only sell. Ask who pulls the permit, who owns the warranty call, and what “turnkey” leaves out.
3. The contractor pulls an electrical permit. Many counties also want a gas or mechanical permit, and some want a zoning check for the pad (setbacks, noise, flood zone).
4. The pad goes in level, on the spot the manual allows. Clear windows, doors, dryer vents, and soffit intakes. Exhaust is carbon monoxide. It must not be able to drift into a bedroom.
5. Fuel piping and the transfer switch land. The electrician does the panel work. Nobody backfeeds a dryer outlet with a suicide cord. That is how linemen get hurt, and it is not a clever shortcut.
6. The inspector looks. The dealer starts the set, sets the exercise clock, and shows you the controller.
7. You keep the permit sign-off, the manual, and the spec sheet.

Fire clearances for a stationary engine are the subject of NFPA 37. The current edition work lives here: <https://www.nfpa.org/codes-and-standards/nfpa-37-standard-development/37>

Manufacturers sometimes test an enclosure so it may sit closer to a wall than the basic rule. That exception is in the install manual for that model, and the inspector still has to accept it. Do not copy a neighbor's pad location.

The U.S. Department of Energy's note on backup power is written for businesses, and the same chores apply at a house: size the load, pick a fuel, get the permits, install to the manual and the code, keep fuel, and test the system. <https://www.energy.gov/ceser/business-owners-prepare-utility-disruptions>

Noise is a neighbor issue and sometimes a county rule. Compare decibels only when both sheets use the same distance. A “quiet” enclosure is still an engine. Place it away from your bedroom window and the neighbor's patio if the lot allows.

Living with it

The first week, learn three things on the controller: how to see that it is in auto (not off), how to read a fault code, and what day it exercises.

Most sets start themselves once a week or every other week and run for a few minutes with no house load, or with a light load. You will hear it. Pick a daytime hour. If the controller allows a “crank only” test, that saves fuel and noise, but it does not prove the set can carry the air conditioner. Once a year, ask the dealer for a real load test, or supervise a short utility-off test if they say that is safe for your switch.

Maintenance is oil, filters, battery, and a clean enclosure. Leaves against the intake, a nest in the exhaust, or snow buried over the unit will make it fail on the worst night of the year. Keep the clearances the manual draws. Do not store gasoline cans beside it.

Fuel habits:

- Propane: check the gauge at the start of storm season and after any long run. Refill before the truck cannot reach you.
- Natural gas: know that a wide gas outage means no generator. Have a small plan for heat and phones that does not depend on the set.
- Diesel: treat the fuel and drain water on the schedule. A full tank of old fuel is not a reserve. It is a clog.

What people are surprised by:

- The house goes dark for several seconds during the transfer. That is normal.
- A managed set may let the upstairs air conditioner wait while the fridge and lights stay on. That is the load shed doing its job, not a defect.
- Electronics survive better when the set is not overloaded. If lights flicker hard every time a motor starts, call the dealer. Do not keep adding loads.
- The weekly test uses fuel and makes noise. Tell the household so nobody calls it a fault.
- Selling the house is easier with the manual, the permit, and a note of the last service date.

A standby generator does not make the house a shelter for the whole block, and it does not replace insurance. It keeps your own chosen loads on while the utility is down, if the fuel is there and the machine was serviced.

A short decision list

Before you sign, you should be able to answer these in one sitting.

- Which outages are we solving, in hours, not in fear?
- Which loads must run, which can wait, and which stay off (especially an EV charger)?
- Natural gas, propane, or diesel, and what fails if that fuel stops?
- What kW is the set on that fuel, and where does load management cover the gap?
- Is the transfer switch in the bid, and who pulls the permit?
- Buy or lease, and what is the five-year cash total either way?
- Where does the pad sit relative to windows, and what does the spec sheet say for noise?
- Who services it in year two, and what does that visit cost?

If a bid cannot answer those, it is not ready.

Sources

1. Generac, "What Size Generator Do I Need?" home standby sizing guide (air-cooled range cited as 10 kW to 28 kW): <https://www.generac.com/resources/home-management/what-size-generator-do-i-need/>
2. Cummins QuietConnect home standby series (natural gas or propane, automatic transfer switch, load management): <https://www.cummins.com/en-na/na/generators/home-standby/quietconnect-series>
3. Kohler Energy / Rehlko home energy pages: <https://www.kohlerpower.com/>
4. NFPA 70, National Electrical Code, standard development page (optional standby is Article 702; generators are Article 445): <https://www.nfpa.org/codes-and-standards/nfpa-70-standard-development/70>
5. NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, standard development page: <https://www.nfpa.org/codes-and-standards/nfpa-37-standard-development/37>
6. U.S. Department of Energy, backup power and permits overview: <https://www.energy.gov/ceser/business-owners-prepare-utility-disruptions>

Local building departments adopt their own code edition and may add rules for pads, noise, flood zones, and fuel tanks. If this paper and the inspector disagree, the inspector wins.

Notes

- Author: Ryan Standley / Record of Sale, LLC / Notice Nearby.
- Discussed on @NoticeNearYou: (pending — fill xPostUrl after live post).
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