

Upgrading Electrical Systems

Is Your Home Ready to Meet the Demands of New Appliances and Modern Technology?

As technologies have evolved, the electrical demands of our homes have evolved in turn. Modern technologies, such as energy-efficient appliances and electric vehicles (EVs), may put new strains on outdated home electrical systems. This guide will help you assess whether your home's wiring and electric panels are up to the task.



1 Signs Your Electrical System May Need an Upgrade

Your home may struggle to meet modern demands if you notice:

- Frequent tripped breakers or blown fuses.
- Flickering or dimming lights when multiple devices run simultaneously.
- Warm power strips or extension cords.
- Discolored outlets.
- An older, small panel, such as one under 100 amps or featuring older components, like fuses.

2 Proactive Steps for Homeowners

- Get an Electrical Assessment:** An electrical professional inspection can identify outdated components in your system and offer the proper upgrades for your needs to maintain safety.
- Prioritize Safety:** Install or check Ground Fault Circuit Interrupters (GFCIs) in kitchens, bathrooms and outdoor areas – anywhere water is present.
- Plan for Future Needs:** Even if you're not ready for an EV or other upgrades, installing a higher-capacity panel or a smart panel (capable of safely managing more breakers) can save money later.
- Stay Code-Compliant:** Ensure your system meets current National Electrical Code (NEC) standards by verifying all your electrical parts can work together.

3 Questions to Ask Your Electrician

When evaluating your home's readiness for advancing electrical demands, questions to ask could include:

- What is the current capacity of my electric panel?
- Do I have enough dedicated circuits or space for new appliances?
- Will my existing circuits handle the energy demands of my new appliance?
- Will my electric panel manage changes to my appliance loads?
- Is my home wired for 240-volt (V) outlets where necessary (e.g., for a water heater, EV charger, dryer, cook stove) along with the more-common 120V plugs?
- Should I consider upgrading to a 200-amp panel or smart load panel?
- What incentives are available for these upgrades?
- Do I need whole-home surge protection?

4 New Technology, New Demands

Modern appliances and devices are more energy efficient but may still require dedicated circuits or upgraded electrical systems to function safely and reliably.

Common examples of new demands include the following:

Heat Pumps: Demand power ranging from 20 to 50 amps depending on the size of the system and the possible need for auxiliary strip heat in cold weather. These components commonly require at least one dedicated 240V circuit.

High-Efficiency Appliances (240V): A dryer uses around 30 amps and requires a 240V dedicated circuit. Compare that to newer washer and dryer combos that pull around 15–20 amps depending on the model. Another comparison would be between electric stoves using somewhere between 30 and 40 amps and newer induction stoves, with power demands in the 40- to 50-amp range.

Water Heaters: Electric resistance water heaters typically pull around 20 amps and require a 240V dedicated circuit. High-efficiency heat pump water heaters need the same size circuit but pull 15–30 amps. Heat pump water heaters may require a larger dedicated circuit but make up for this in overall energy efficiency.

EVs: Require Level 1 or Level 2 chargers, often needing 120V or 240V outlets and dedicated circuits. Level 2 chargers can pull up to 80 amps, requiring up to a 100-amp circuit breaker. If your home only has a 100-amp electric panel, upgrading to a 200-amp panel is required before an EV charger can be installed.

Smart Home Devices: Increased connectivity (Wi-Fi routers, security systems, etc.) may not strain power but could benefit from surge protection.

5 Electric Panels: The Backbone of Your System

Older homes may have electric panels rated for only 60 to 100 amps, whereas modern homes often require 200 amps or more. **Consider upgrading your panel if you:**

- Add high-power appliances (e.g., a heat pump or hot tub).
- Expand your home or add new rooms.
- Regularly experience overloaded circuits.
- Want to go all-electric with your appliances.
- Plan to install an EV charger.

Tip: Consult a licensed electrician to determine if your panel can handle new demands and contact your local electric cooperative with any questions.

6 Surge Protection: A Small Investment for Big Protection

Power surges, often caused by storms or grid fluctuations, can damage sensitive electronics and appliances. Surge protectors can safeguard your devices in ways that traditional fuses or circuit breakers may not.

Reasons newer devices are more vulnerable:

Sensitivity to Voltage Fluctuations: Devices such as computers, televisions, routers, smart home systems and phone chargers contain sensitive electronic components (e.g., microprocessors). These components are easily overwhelmed by sudden voltage spikes, even if the surge is relatively small. New large appliances with “smart” features are also vulnerable to spikes as they employ the same microprocessor technology as their smaller counterparts.

Absence of Built-in Protection: Many devices lack robust internal surge protection mechanisms, relying on external surge protectors or whole-home systems to shield them.

Common Usage with Outlets: Many electronics are often connected directly to standard 120V outlets, making them vulnerable to any surges traveling through the home’s wiring system.

Types of surge protection:

Power Strip Surge Protectors: Affordable and portable, ideal for small electronics.

Whole-Home Surge Protectors: Installed at the electric panel for comprehensive protection, especially valuable for homes with newer appliances and connected devices.

To learn more, [Eaton](#), a trusted electrical product company, and the [National Fire Protection Association \(NFPA\)](#), the national code body, wrote about how surge protectors are rated and the proper level of protection for your home.