

TECHNICAL ARTICLE

# The 2023 NEC® and what it means for residential construction



The 2023 NEC includes updated requirements for ground fault circuit interruption (GFCI), arc fault circuit interruption (AFCI), surge protection, emergency disconnect and other areas affecting residential construction. ABB has the expertise, products and solutions to help you comply with the NEC and the latest code changes for 2023.

## Why the NEC matters

NFPA 70®, the National Electrical Code® (NEC), is “the benchmark for safe electrical design, installation and inspection to protect people and property from electrical hazards,” according to the National Fire Protection Association (NFPA), developers of the code.

The code is not federal law, but some form or version of the NEC has been adopted by all 50 states. Thus, compliance with the NEC within the U.S. is not optional, but mandatory, and critical to the safety and wellbeing of workers, homeowners and tenants.

### NEC adoption by state

Every three years, the NFPA updates the NEC. As you can see from the map on the following page, different states adopt the NEC at different rates. As of February 1, 2023, 28 states had adopted the 2020 NEC, six of which had already begun the process of moving to the 2023 NEC — Massachusetts, Minnesota, North Carolina, Oregon, Texas and Wyoming.

It’s important to note that local authorities having jurisdiction (AHJs) and governing bodies may impose

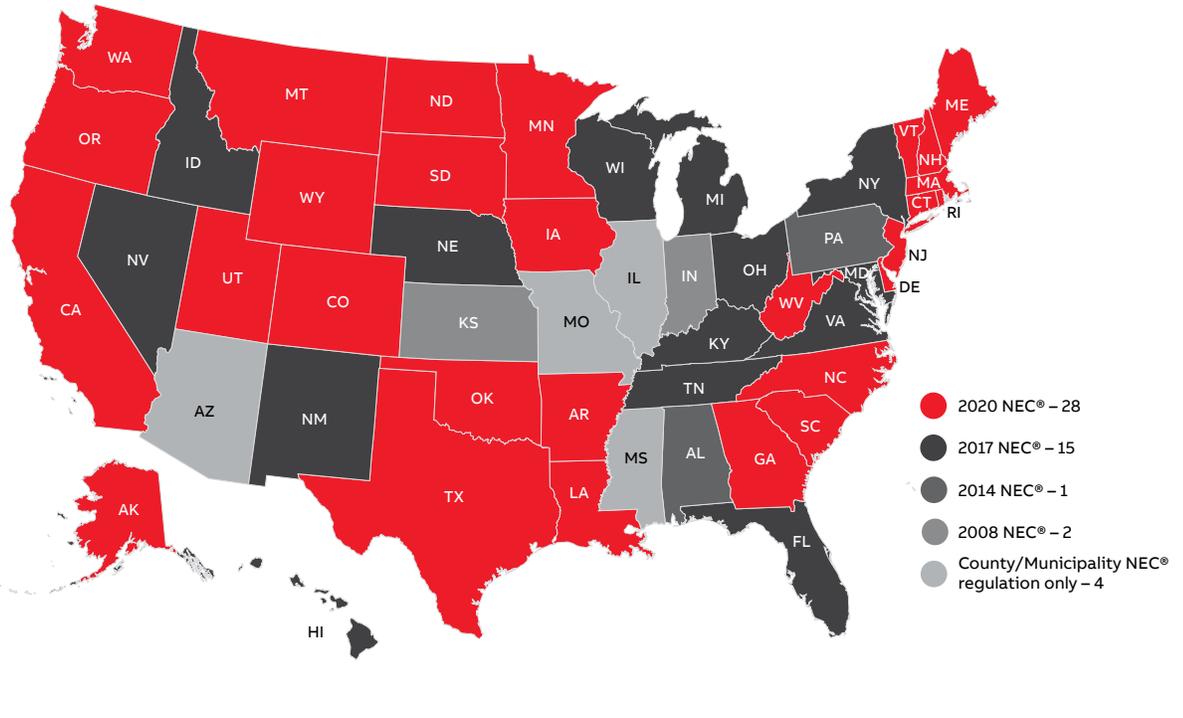
additional requirements to and/or deviations from the NEC, so you should always confirm code requirements with the local jurisdiction.

### GFCI protection for kitchen outlets

The 2020 NEC required GFCI protection for kitchen receptacles serving countertops. One significant change the 2023 NEC delivers for residential construction is the extension of that requirement beyond the countertop. Now all 125 V to 250 V receptacles anywhere in a kitchen must have GFCI protection, regardless of their location or proximity to a sink. This protection can be provided by either a GFCI breaker or a GFCI receptacle; however, the code requires that the GFCI be readily accessible, making the GFCI breaker the easier option to achieve this. See GFCI breaker offering on page 3.

In addition to kitchens in residential dwellings, areas with sinks intended for food and beverage preparation or service in non-dwelling facilities, such as office break rooms, now also require GFCI protection for receptacles.

01 NEC in effect as of Feb. 1, 2023, according to NFPA. To view the NFPA's latest NEC adoption maps, visit <https://www.nfpa.org/NEC/NEC-adoption-and-use/NEC-adoption-maps>.



### **GFCI protection for specific appliances — whether plug-connected or hard-wired**

The 2023 NEC provides a list of specific appliances that require GFCI protection regardless of whether they are hard-wired or plug-connected. These appliances, rated 150 V to ground and 60 A or less, single-phase or three-phase, must now have GFCI protection for the appliance branch circuit or outlet. The specified appliances are:

- Automotive vacuum machines
- Drinking water coolers and bottle fill stations
- High-pressure spray washing machines
- Tire inflation machines
- Vending machines
- Sump pumps
- Dishwashers
- Electric ranges
- Wall-mounted ovens
- Counter-mounted cooking units
- Clothes dryers
- Microwave ovens

### **GFCI protection for outdoor outlets**

The 2020 NEC requirement for GFCI-protected outdoor outlets resulted in excessive nuisance tripping of connected air conditioning units; therefore, the 2023 NEC includes an exception for listed HVAC equipment.

Receptacles of 50 A or less located outdoors or in garages, boathouses or accessory buildings must be GFCI protected, and if unprotected existing equipment is replaced, GFCI protection must be added.

### **Outdoor emergency disconnects**

The 2020 NEC addressed outdoor emergency disconnects for service-supplied power to single- and two-family homes. 2023 NEC Article 225.41 now requires outside emergency disconnects for feeders supplying single-family and duplex homes. The disconnect must have a short-circuit rating equal to or greater than the available fault current, and if more than one disconnecting means is provided, they must be grouped.

The disconnect must be clearly labeled “EMERGENCY DISCONNECT” and located in a readily accessible outdoor location or within sight of the dwelling. The intent of this new article is to ensure that first responders can easily find the disconnect and shut off power to the dwelling in case of emergency regardless of how the power is supplied.

### **Disconnects in residential spaces**

For readily accessible disconnects located in residential spaces, such as those for air conditioning units, the 2023 NEC adds a new safety requirement. If the disconnect’s doors can open to expose live parts, those doors must either be lockable or require tools to open. This requirement is intended to help deter access by children or other unqualified personnel.

### **GFCI protection for receptacles in pool areas**

All receptacles rated 125 V to 250 V, 60 A or less, located within 20 feet of a pool wall must now have GFCI protection. This expands the previous requirement, which only applied to 125 V, 15 A and 20 receptacles.



01 Arc fault (AFCI) breaker



02 Ground fault (GFCI) breaker



03 Dual function (DFCI) breaker



### Avoid misapplication of breakers

Both the 2020 and 2023 NEC introduced new requirements for GFCI, AFCI and DFCI breakers. It's critical to use the right type of breaker to comply with NEC requirements designed to protect people and property.

Arc fault (AFCI) breakers — Help prevent the arc faults that can result in electrical fires. Required by 2023 NEC for use in:

- Family room
- Dining room
- Living room
- Bedroom
- Sunroom
- Library
- Den
- Office hallways
- Closets
- Recreation room
- Kitchen (except where otherwise noted)

Ground fault (GFCI) breakers — Help protect people from electric shock. Required by 2023 NEC for use in or with:

- Bathroom
- Garage
- Porch

- Pool area
- Clothes dryer
- Kitchen
- Outdoors (except for use with listed HVAC equipment)

Dual function (DFCI) breakers — Provide both ground fault and arc fault protection. Required by 2023 NEC in or with:

- Kitchen
- Dishwasher
- Clothes washer
- Laundry room or area

### Surge protection for all dwelling unit services

2020 NEC Article 242 introduced the requirement that all dwelling unit services must be provided with surge protection. This has not changed for 2023, but is increasingly being enforced more strictly in the field. The surge protective device (SPD) must be either an integral part of service equipment or located immediately adjacent to service equipment unless it's located at each level of downstream distribution. Either a listed Type 1 or Type 2 SPD will satisfy the requirement. Bear in mind that Type 1 SPDs offer the highest ratings and can be installed on either the line or load side of the load center, while a Type 2 SPD must only be used on the load side.

**A comprehensive range of solutions to meet  
NEC requirements.**

ABB offers a full range of GFCI, AFCI and DFCI circuit breakers, Type 1 and Type 2 SPDs, safety disconnect switches and enclosed circuit breakers, as well as the technical expertise to consult with you on your residential construction challenges. At ABB, we know code changes can be confusing, but we're here to help guide you through any questions you may have, and we're prepared with products and solutions to help you meet the 2023 NEC.

To learn more, visit <https://electrification.us.abb.com/industries/residential> or scan the QR code.

