

219 Lighting Specifications

Wiring Code Overview

Electrical wiring code is something you must become familiar with do any home wiring project right. If you have it inspected, which is normally required, you'll want to be following these wiring codes as well. Here are a few commonly used codes that apply to residential wiring. You should check local codes for your areas to ensure proper compliance but these codes are pretty standard in most parts of the U.S. Wiring requirements are governed by the National Electric Code (NEC) and new versions of the code come out every few years. Be sure to check with your local building department to determine which version you are required to meet. There is a link at the bottom of this page for you to access the actual NEC code books for free.

Kitchen Wiring Codes

The following are **common wiring codes** for your kitchen.

-A minimum of two 20-amp small appliance branch circuits are required for portable appliances that are used in kitchens and dining areas. These circuits are in addition to those that supply lighting or permanently installed appliances. Portable kitchen appliances have short cords so they are not as likely to be run across sinks or cook tops. A receptacle is needed to serve every countertop 1 ft or more in width.

-Outlets above the kitchen counter (for countertop appliances) should be fed by both circuits, not wired to just one circuit. The circuits for these outlets should not supply any other lights or outlets in the house.

-Recommended that refrigerator be on individual branch circuit but it can be tied to small appliance branch circuits in kitchen.

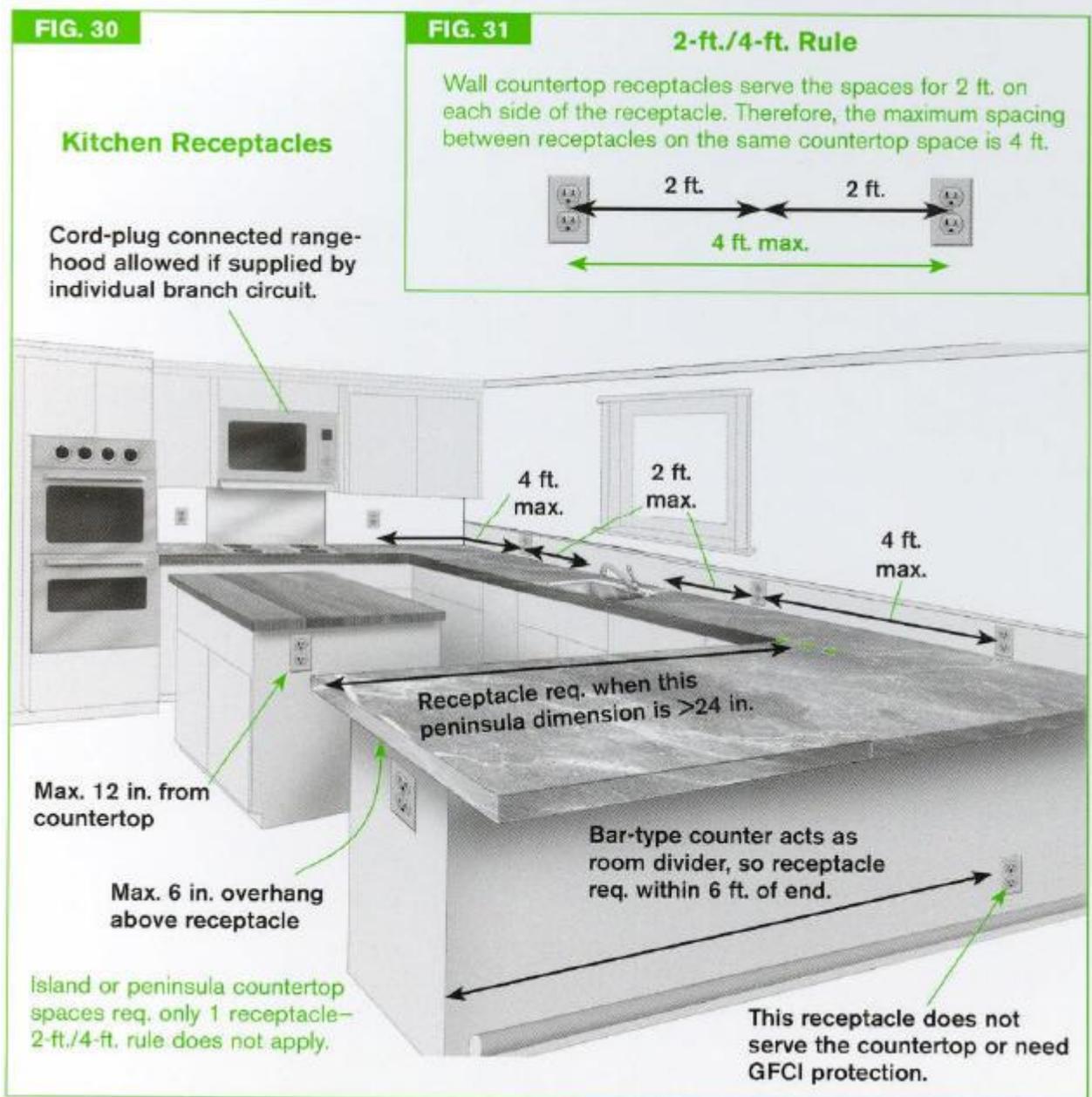
-Dishwasher and disposal should be on separate branch circuits from the small appliance circuits.

Note: New in NEC 2014 - Dishwasher branch circuit (receptacle or hardwired) is required to be GFCI protected

-Countertop receptacles must all be GFCI protected

-Receptacles must be spaced so no point is more than 24 inches from a receptacle. See 2-ft./4ft. rule below.

-Receptacles can be a max of 20in above countertop



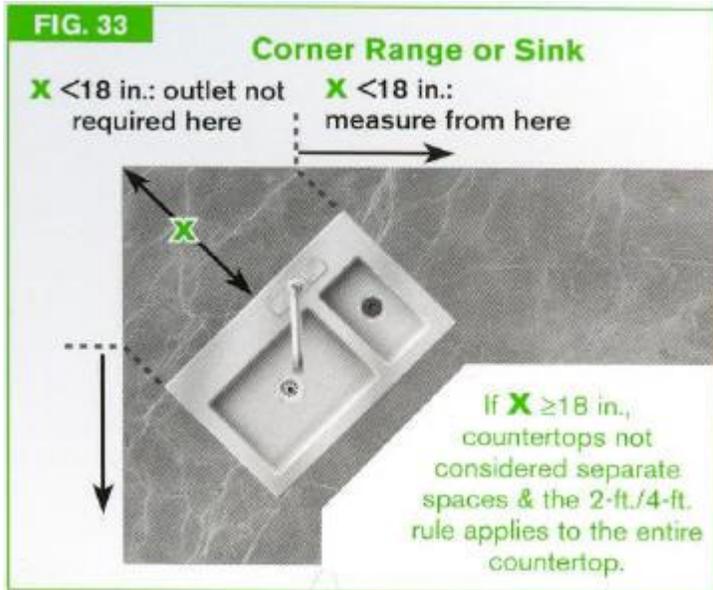
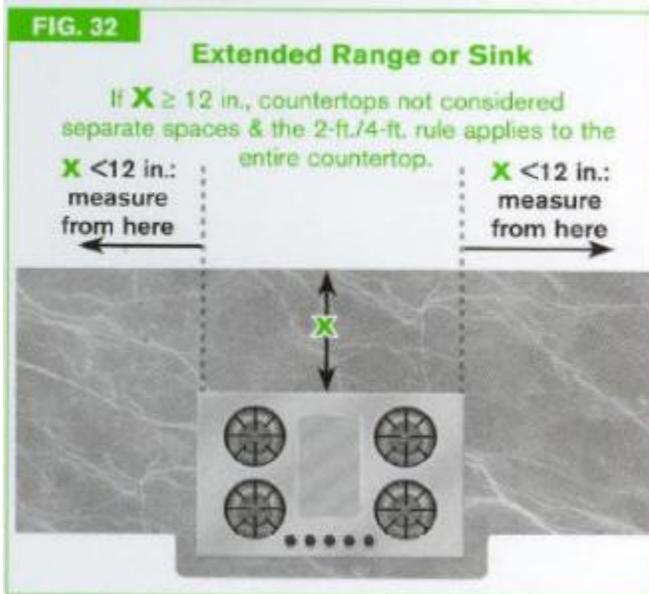
-Peninsula countertop spaces require receptacles if long dimension >24in and short dimension <12, measured from connecting edge.

-Island and peninsula countertop spaces require a min 1 receptacle per space - no 24in rule applies.

-Island and peninsula receptacles man be mounted no more than 12in below counter if max 6in overhang and no backsplash or means of installing receptacle above countertop exist.

-Face-up countertop receptacles are not allowed per code

-Area behind sink or range not consider countertop space if <12in for straight wall or <18in for corner appliance. See wiring code diagrams below.



Appliance Wiring Codes

-Separate circuits are required for built-in appliances (i.e.. range, over, dishwasher, disposal, central AC, furnace)

Note: New in NEC 2014 - Dishwasher branch circuit (receptacle or hardwired) is required to be GFCI protected

-One 20-amp circuit is needed for the laundry outlet within 6' of the machines. An electric dryer requires an additional 240-volt dedicated circuit.

Note: New in NEC 2014 - GFCI protection required for all 125-volt, single-phase, 15- and 20 amp receptacles in laundry rooms.

Outlet Wiring Codes

The following are common wiring codes for outlets in the rest of your house:

-One lighting/convenience outlet circuit should be provided for every 575 sq ft of floor space in a house.

-Any bathroom or garage outlet within 6ft of a sink must be Ground-Fault Circuit Interrupter (GFCI) protected. All kitchen outlets for countertop must be GFCI protected. Bedrooms outlets should be Arc-Fault Circuit Interrupter (AFCI) protected.

-At least one GFCI outlet is required in an unfinished basement, as well as most outdoor outlets. Exceptions include inaccessible outlets like those in a garage ceiling or behind a refrigerator.

-Walls 2ft or more in width require a receptacle

-Partitions and bar-type counters counts as walls

-Doorways and fireplaces are not counted as walls

-Receptacles required within 6ft horizontally of any point along a wall.

-Receptacles required for hallways greater than 10ft in length

-Receptacles must be mounted less than 5 1/2ft high

-Floor receptacles >18in from wall do not count towards required receptacles

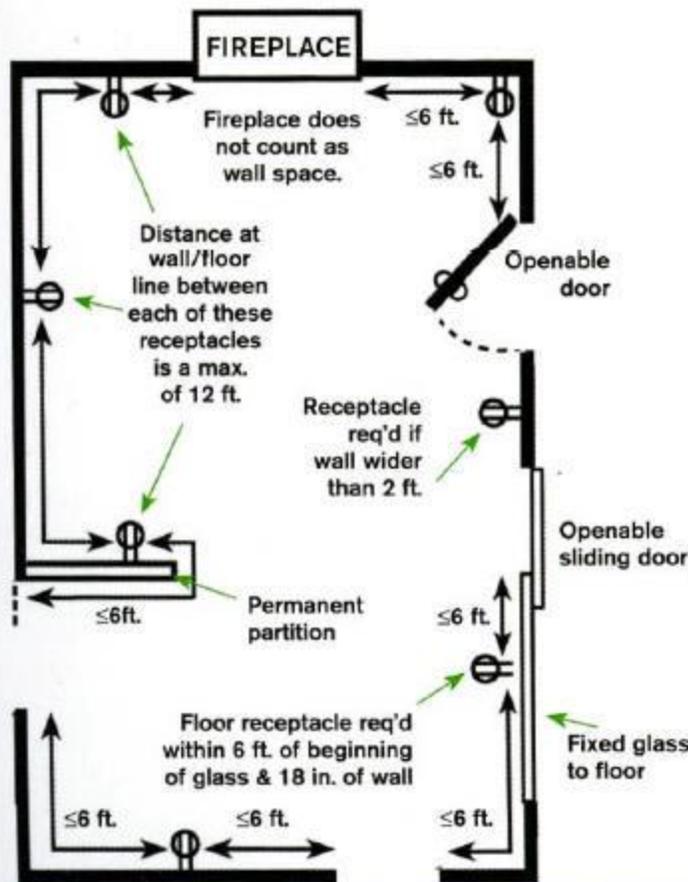
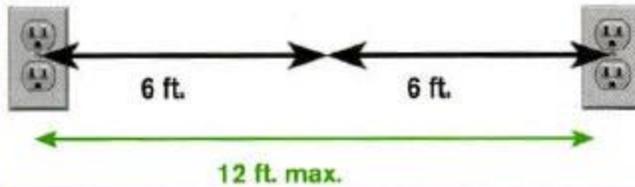
FIG. 27

6 ft. & 12 ft. Rule

FIG. 28

6 ft. & 12 ft. Rule Explained

Wall receptacles serve the spaces for 6 ft. on each side of the receptacle. Therefore, the maximum spacing between wall receptacles is 12 ft.



GFCI Wiring Code Requirements

The follow wiring codes apply to all 15A and 20A receptacles on 120V circuits. They do not apply to 240V receptacles or 30A 120V receptacles

-All bathroom receptacles require GFCI per code

-All garage and accessory building receptacles (exceptions for receptacles in garage and basements that are not readily accessible or that serve appliances like a freezer)

-All receptacles in unfinished basements

-All outdoor receptacles (exceptions for deicing equipment on dedicated branch if located so not readily accessible)

-All receptacles in crawl spaces at or below grade level

-All receptacles serving kitchen counters

-Receptacles within 6 ft of outside edge of laundry, utility, or wet bar sinks

Note: NEC 2014 - Additional areas requiring GFCI protection:

-Laundry room receptacles

-Dish washer (receptacles or hardwired - GFCI must be readily accessible)

Bathroom Wiring Codes

-Receptacle required on wall within 3ft of each basin or may be in cabinet side or face <12in below countertop

-No face-up outlets on vanity countertop

-No receptacles with or directly over tub or shower

-Separate 20A circuit for bath receptacles or dedicated 20A circuit to each bathroom

Laundry Wiring Codes

These are common wiring codes for your laundry room:

-Minimum of one 20A circuit to laundry receptacles

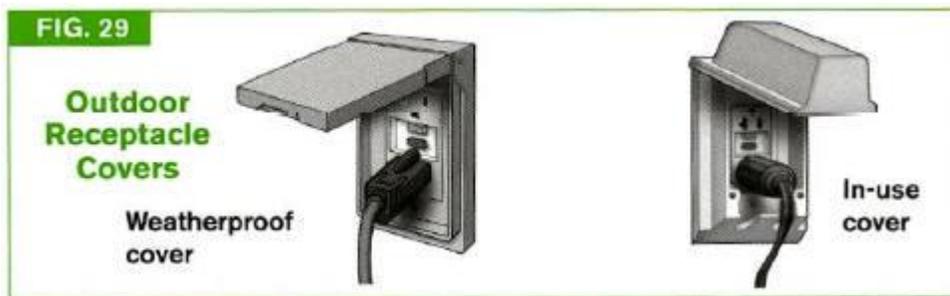
-No other outlets on laundry receptacle circuit

-Electric Dryer min 30A dedicated circuit (10AWG copper)

Outdoor Wiring Codes

These are common wiring codes required for outlets that are placed outdoors or on the outside of your house.

- Receptacles accessible from grade required at front and rear of dwelling, max 6 1/2ft above grade
- Receptacle required for balconies with interior access and >20 sq ft
- Receptacles in damp or wet locations required to be listed weather-resistant type
- Outdoor damp location receptacle (e.g. covered deck) require weatherproof cover
- Wet location 15A or 20A receptacles require in-use covers



Light Switch Wiring Codes

The following are common wiring codes for residential light switches:

- Wall-switch controlled lighting outlets required in all habitable rooms and bathrooms
- Habitable room lighting outlets may be switched receptacle except in kitchen and bathroom
- Wall-switch controlled lighting outlets required in hallways, stairways, attached garages, and detached garages with power
- Interior stairs require switch at each entrance if 6 or more stairs exist
- Lighting outlet required on exterior side grade-level doors
- Lighting outlet required at garage egress doors
- Lighting outlet not required at garage vehicle doors

Basic Residential Electrical Wiring Rough In and Codes Guide

What are the basic residential wiring circuits? Can you put the hall plug on the same breaker as the dining room? How many switches have to be in the stairwell? What size wire do you use for a dryer? How many amps can 12-2-WG take? All of these questions are answered somewhere in the 700 (more or less) pages of the National Electric Code. Luckily many of the most common residential wiring questions are answered right here on just a couple of pages. This is not intended to replace the NEC or the necessity to become familiar with the NEC.

This article is not intended to be a complete guide on the subject of residential wiring, but only an aid to those who already have some knowledge on the subject.

Required Receptacles - Code Summary

For most areas of a house, receptacles must be no more than 12 feet apart and no more than 6 feet from a door or entryway - IE, every point on almost all walls should be no farther than 6 horizontal feet from a receptacle. The wall spaces formed by fixed room dividers, such as freestanding counters, or railings, are included in the six-foot measurement.

Receptacles installed in the floor within 18" of the wall may be used in place of wall-mounted receptacles. Receptacles installed in the floor must use a box-receptacle combination designed specifically for that purpose.

Every hallway over 10 feet long must have at least one receptacle - other than this, hallways are exempt from the 6 foot rule.

No outlets may be installed over an electric baseboard heater.

Plugs which are located behind a stationary appliance such as a refrigerator or washing machine do not count when considering plug spacing.

Any wall space that is 2 feet or more in width must have a receptacle.

Every basement and garage must have at least one receptacle, and all must be GFCI protected. At least one receptacle must be installed in the each unfinished portion of a basement. This receptacle is in addition to any receptacles that may be installed for laundry or other specific purposes.

One 20-amp branch circuit must be provided for the laundry. This circuit is limited to receptacles within the laundry room. No other outlets are permitted on this circuit.

There must be at least two GFCI plug on the outside of the house located near the front and back doors, and all exterior plugs must be GFI protected. Note: Outdoor outlets installed in wet locations shall have an enclosure that is weatherproof whether or not it is in use.

An accessible 15 or 20 amp plug must be within 25 feet of all HVAC equipment.

As a general rule you may have up to 10 receptacles on a single circuit, but this is a gray area which is subject to the discretion of the codes official.

Dining room plugs must be on a separate circuit,

At least one 20-amp circuit for bathroom receptacles must be supplied. Each bathroom must have its own GFI plug circuit with a plug near the wash basin, and no lights or other plugs or appliances on these circuits. Where a 20-ampere circuit supplies a single bathroom, outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance with 210.23(A). This circuit shall NOT be used to supply a major fixture such as a whirlpool or hot tub!

At least one 15 or 20 amp, 120 volt GFCI protected receptacle must be installed at an indoor spa or hot tub location - not closer than five feet from the inside wall of the unit and not more than ten feet away from it. Light fixtures, outlets and ceiling fans over spas and hot tubs shall be a minimum of 7'6" above the maximum water level. Note - pump motors and other spa related electrical equipment must remain accessible for service after all finishes are in place. Accessible does not include cutting holes in walls, or removing tile - plan ahead, and use common sense.

Outdoors spa or hot tubs have the same requirements as a swimming pool. Check in section 680 of the NEC for those requirements.

Note that all bedrooms outlets must be protected by an arc-fault circuit interrupter listed to provide protection of the entire branch circuit. This includes wiring to the smoke detector outlets. 210.12, NEC

Kitchen Receptacles - Code Summary

In the kitchen and eating areas every counter space wider than 12 inches must have a GFCI protected plug, in general all kitchen counter top plugs should be GFCI protected. Countertop receptacles shall be installed so that no point along the wall is more than 24" measured horizontally from a receptacle outlet in that space. Peninsular bars and islands 12" or wider shall have at least one receptacle. Exception: Tennessee Code in dwelling unit's section states, "The installation of receptacles for island counter spaces and peninsular counter spaces below the countertop shall be optional.

At least two 20-ampere branch circuits are required to feed receptacle outlets for small appliance loads, including refrigeration equipment in the kitchen, pantry, breakfast room, and dining room. These circuits, whether two or more are used, shall NOT supply anything other than receptacles in these areas. Lighting outlets and built-in appliances such as garbage disposals, hood fans, dishwashers, and trash compactors are NOT permitted on these circuits.

Kitchen counter top receptacles must be supplied by at least two small appliance branch circuits.

Kitchen appliance and convenience receptacles must be on 20 amp breakers, and wired with 12 gauge wire.

Required Ground Fault Protection

A ground fault circuit interrupter (GFCI) must protect ALL receptacles listed below:

Bathroom receptacles.

Outdoor receptacles.

Garage receptacles.

Kitchen receptacles that serve counter top surfaces

Counter top receptacles within 6 feet of a wet bar sink.

Appliance Branch Circuits - Code Summary

The following Appliances must be on a separate 20-amp circuit: Dishwasher, Garbage disposal, Washing machine.

As a general rule All 240-volt appliances must be on their own circuit.

Hot tubs, garden tubs, Jacuzzis and the like must be GFI protected and wired as required for the particular model and local codes.

The service areas of all appliances must be accessible after the final finish is complete.

Required Light Fixtures - Code Summary

"Every room, hallway, stair way, attached garage, and outdoor entrance must have at least one light fixture controlled by a wall switch. However, in most rooms other than kitchens and bathrooms, the wall switch may control one or more plugs into which lamps may be plugged instead of a ceiling or wall mounted fixture."

There must be at least one wall switch controlled light in a utility room, attic, basement or under floor space used for storage or which contains equipment such as heat and air, water heaters, sump pumps, etc. which may ever require service. The switch must be located at the entry point to these areas.

Hallways and stairs with more than six steps require the lights to be controlled by a switch at each end.

In closets, fluorescent fixtures must have at least 6 inches of clearance away from shelves or storables. In a typical two foot deep (approx.) closet, the fixture will be mounted on the wall just over the door.

In summary, put a light in every room or large closet, outside of every exterior door, and under the floor and in the attic if there is electrical equipment in these spaces or if they are suitable for storage.

Switch the room lights at every door entering the room, switch a hall or stairway at both ends, and switch exterior lights at the doors which they service.

Smoke Detectors - Code Summary

There must be a 120-volt battery backup smoke detector on the ceiling, or on the wall close to the ceiling in the area outside of every bedroom, and inside of each bedroom. All smoke detectors must be tied together so that if one goes off they all do. Smoke detectors must be protected by an arc fault breaker.