Ground Fault Circuit Interrupters – Quick Tips



OSHA 1910.399 defines a ground fault circuit interrupter, or GFCI, as “a device whose function is to interrupt the electric circuit to load when a fault current to ground exceeds some predetermined value, that is less than that required to operate the over-current protective device of the supply circuit.”

Ground fault circuit interrupter is designed to shut off electric power within as little as 1 /40 of a second. The mechanism compares the amount of current going into the electric equipment to the amount of current returning along the circuit conductors. If the current exceeds six milliamperes, the ground fault circuit interrupter discontinues the current to prevent electrocution.

These safety devices can be incorporated into special outlets, included as part of a power cord or placed in-line to continually monitor the current passing through a receptacle. When a difference in current is sensed, indicating a leakage, the GFCI quickly breaks the circuit to prevent injury.

Ground fault circuit interrupters protect people the way breakers and fuses protect wiring in a home or business. As electricity follows the path (route) of least resistance, if an individual were to touch an electrical system with a leak that did not have a ground fault circuit interrupter, the individual would serve as a better route for the electricity to pass through. Conversely, if the electrical system with a leak had a ground fault circuit interrupter, the device would activate before the electricity reached the person.

Where are they used?

Ideal areas for using ground fault circuit interrupters include wet or humid environments and high-risk areas where people could come into contact with ground, or ground equipment. In home use, ground fault circuit interrupters can typically be found in kitchens and bathrooms. Other applications include outdoor outlets, spas and swimming areas. Occupations that use ground fault circuit interrupters include dairy farms, breweries, steam plants and construction sites.

The following ground fault circuit interrupter regulations come from OSHA’s Construction Standard 1926.404 – Wiring Design and Protection for Construction

Sub part K of the 29 Code of Federal Regulations (CFR):

1926.404 (b)(l)(ii)

Ground fault circuit interrupters (GFCIs). All 120V, single-phase 15A and 20A receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground fault circuit interrupters for personal protection. Receptacles on a two-wire, single-phase portable or vehicle mounted generator, rated not more than 5KW, where the circuit conductors of the generator are insulated from the generator frame and all other ground surfaces need not be protected with ground fault circuit interrupters.

1926.404 (b)(l)(iii)

Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure and equipment connected by cord and plug which are available for use or used by employees. The program shall comply with the following minimum requirements:

1926.404 (b)(l)(iii)(A): A written description of the program, including the specific procedures adopted by the employer, shall be available at the job site for inspection and copying by the Assistant Secretary and any affected employee.

1926.404 (b)(l)(iii)(B): The employer shall designate one or more competent persons (as designed in 1926.32(f)) to implement the program.

1926.404 (b)(l)(iii)(C): Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day’s use for external defects such as: deformed or missing pins, insulation damage, or indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

Ground fault circuit program requirements

Employers must provide:

- Written description of program
- Competent person to implement the program
- Inspection and testing
- Records of test results

Inspections/Tests

Visual inspection of the following equipment is required:

- Cord sets
- Cap, plug and receptacle of cord sets
- Equipment connected by cord and plug

Exceptions:

- Receptacles and cord sets that are fixed and not exposed to damage

Frequency of tests:

- Before first use
- After repair and before placing back in service
- Before use after suspected damage
- Every three months—however, cord sets and receptacles exposed to damage must be tested at regular intervals not to exceed six months

Conduct tests for:

- Continuity of equipment of grounding conductor
- Proper terminal connection of equipment grounding conductor

Note: For additional information please see 29 CFR 1926.404

Q: Do I need to test GFCIs?

A: Yes, GFCIs should be tested periodically to ensure they are working properly. It is recommended to follow manufacturer's instructions regarding the testing of the ground fault circuit interrupter.

Source

29 CFR 1926.404

29 CFR 1910.399

N.E.C. National Electric Code

OSHA booklet: *Controlling Electrical Hazards*

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