

# SAFETY FIRST: THE 2017 NEC GFCI GUIDELINES & OUTDOOR POWER



## OUTDOOR POWER HAS COME A LONG WAY.

From personnel dragging extension cords to create makeshift solutions to new outdoor in-ground boxes that use unique diving bell designs to stay weather-resistant, we've seen innovations in this space like never before.

Safety is one of the highest concerns when it comes to outdoor power. The National Electrical Code (NEC) consistently sets the standard for codes and compliance in the electrical industry and creates guidelines specifically in place for the use of outdoor power.



Large venues with frequent events require access to power that is convenient, reliable and safe. More and more facility managers and their teams are turning to innovations like in-ground boxes to provide permanent outdoor power to environments where people gather.

## GFCI PROTECTION FOR OUTDOOR SPACES

When it comes to outdoor power, the Ground-Fault Circuit-Interrupter (GFCI) is integral to keeping personnel safe. The NEC requires GFCI protection for most outdoor power applications. Because of this, it's important to understand the guidelines for GFCIs and their importance to outdoor power safety.

## PREPARE FOR ANYTHING

Many outdoor power solutions can be clunky and unsafe, offering little to no protection for personnel and exposing sensitive power systems to rain or snow. Using an outdoor in-ground box can provide a safe alternative solution to these other options, as these boxes are designed specifically with outdoor power in mind.

While in-ground boxes are designed to withstand many elements, including harsh weather, there is a slight chance something could happen. A failure could happen with an in-ground box due to a number of reasons.

## HERE ARE A FEW EXAMPLES:

1. IMPROPER INSTALLATION OR USE
2. EXCESSIVE IMPACTS OR LOADS
3. VANDALISM

WHILE REASONS FOR AN OUTDOOR GROUND BOX FAILURE ARE UNUSUAL, USING A GFCI CAN HELP IN THIS RARE EVENT AND IS REQUIRED FOR MOST OUTDOOR POWER SOLUTIONS.

## Unsafe, Unsightly Power Solutions



## Innovative, Discreet Power Solutions



## PROTECT YOUR PERSONNEL

If you're concerned about the safety of your personnel, a GFCI helps during a failure. In the event of a failure, where water might contact the device or connection points located within the outdoor in-ground box, personnel must be protected. A remotely located GFCI that is upstream of the ground box can provide this protection and keep people safe.

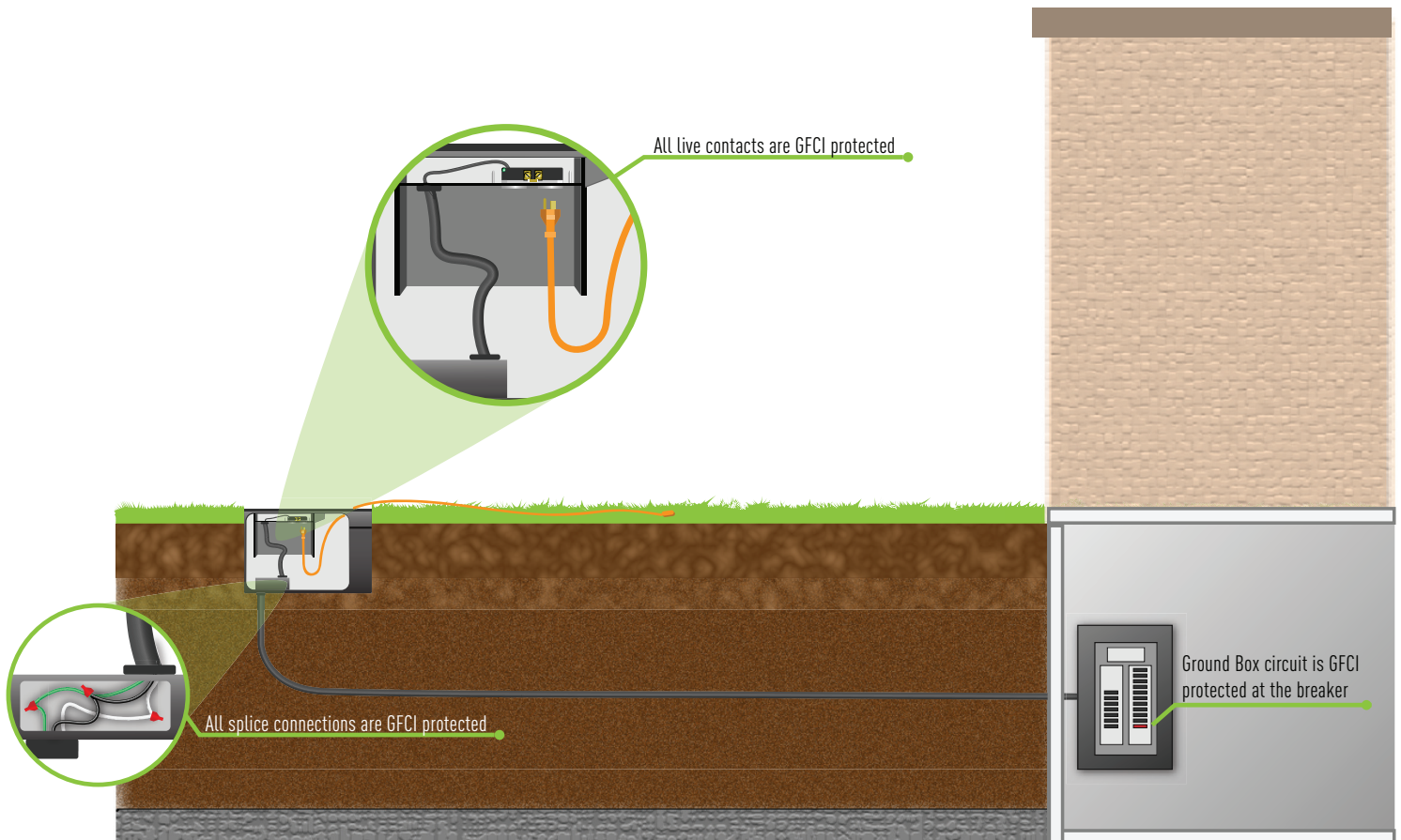
All ground box electrical circuits must be protected by a GFCI upstream from the ground box to comply with UL 2996 In-Ground Boxes.

## GFCI DEFINITION & REQUIREMENTS

According to the NEC, a GFCI is "a device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds the values established for a Class A device."

This means a GFCI's main purpose is to protect people, and it does this by de-energizing circuits when it detects current leakage to ground. There are specific values designated for when a GFCI trips: When the current to ground is 6 mA or higher, a Class A GFCI will trip.

OUTDOOR GROUND BOXES MUST BE PROTECTED BY A CLASS A GFCI, WHICH CAN BE EITHER A BREAKER OR A RECEPTACLE.





## 2017 NEC GFCI GUIDELINES

The NEC has specific guidelines for the use of GFCI breakers and receptacles for outdoor power. Article 210.8 covers the applicable code guidelines for the use of GFCI Protection for Personnel. Manufacturers of GFCI devices and breakers recommend that the GFCI is not connected to over 250 feet of load conductor in order to prevent nuisance tripping, including the cord that connects to the load.

### THE 2017 NEC GFCI GUIDELINES:

- The GFCI **shall be** installed in a readily accessible location
- All 125-volt, single-phase 15- and 20-ampere receptacles installed outdoors **shall have** ground-fault circuit-interrupter protection for personnel
- All single-phase receptacles rated 150 volts to ground or less, 50 amperes or less and three-phase receptacles rated 150V to ground or less, 100 amperes or less installed outdoors **shall have** ground-fault circuit-interrupter protection for personnel

## UL 2996 GUIDELINES

All products listed to UL 2996 have certain guidelines for their investigation. When using one of these products, it is imperative that these guidelines are followed.

1. Must be marked "GFCI Protected Remotely" or equivalent
2. Installation instructions shall indicate the disconnection and GFCI means must be located remotely from the enclosure
3. GFCI protection must be installed in a readily accessible location
4. The GFCI should not be located in the box itself\*

\*In this scenario, only the cord and the load downstream of the GFCI are protected. The termination points on the back of the GFCI receptacle are not protected.



UNDERSTANDING  
UL 2996 & NEC  
GUIDELINES WILL  
HELP ENSURE THE  
SAFE INSTALLATION  
OF THESE OUTDOOR  
IN-GROUND BOXES.

## OPTIONS FOR COMPLIANCE

You can use either a GFCI breaker or a GFCI receptacle to satisfy the requirements of the NEC. Powering the ground box from the load side of a GFCI receptacle, located outdoors in a NEMA 3R enclosure, would allow the GFCI to be closer to the ground box (less than the recommended 250 feet).

Legrand offers several configurations of the in-ground box to meet your outdoor power requirements. Using products specifically listed for use outdoors and understanding the NEC guidelines for GFCI protection will ensure a safe and compliant installation.



### **XB814C520**

20A GFCI Class A Single Pole  
Circuit Breaker or 20A GFCI  
Receptacle

### **XB814C520C2**

20A GFCI Class A Double Pole  
Circuit Breaker

### **XB814C530**

30A GFCI Class A Single Pole  
Circuit Breaker

### **XB814C630**

30A GFCI Class A Double Pole  
Circuit Breaker



FOR MORE INFORMATION, VISIT:

[legrand.us/groundbreaking](https://www.legrand.us/groundbreaking)

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