



Tom Pernal Electrical Seminars, LLC

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# Emergency Disconnects on 1 and 2-Family Dwellings

Crackerbarrel Handout  
2023 New Jersey Building Safety Conference  
Atlantic City, New Jersey

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April 14, 2023

## Emergency Disconnects for One and Two-Family Dwellings

As with any adoption of a new code, new requirements come along with it. The 2020 edition of the National Electrical Code - NFPA 70. was adopted on September 6, 2022, at NJAC 5:23-3.16. With it came Article/Section 230.85, Emergency Disconnects, and applies to new services on one and 2-family dwellings only. For those of you familiar with the building codes, please do not apply these definitions. Remember, the NEC/2020 has specific definitions In Article 100, and this is where you would find how Article 230.85 applies to these types of buildings:

A "Dwelling, One-Family" means "A building that consists solely of one dwelling unit" and a "Dwelling, Two-Family" means "A building that consists solely of two dwelling units".

Seeing the word "solely" above means Article 230.85 applies to one and two-family detached dwellings; this would not apply to townhouses/rowhomes or multi-family buildings.

When it comes to a Rehabilitation project, one will note that the materials and methods at N.J.A.C. 5:23- 6.B(d) does not delete this section and would be included per the scope of a project, as outlined at N.J.A.C. 6:23-6.2(b). This requirement would be limited to complete service changes and upgrades to these types or homes. "Complete" implies that the project includes new service conductors, service entrance conductors and service equipment.

Some Examples:

- On a new 1 or 2-family dwelling, emergency disconnects, and surge protection are both required.
- Replacement of Circuit Breaker Panel only? No

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- S.E. cable/conductors and/or Meter Socket replacement only?  
No
- You must indicate 2017 Rehab on your permit if you wish, up until September 6, 2023
- Replacing an entire service with one of identical size? 2020 NEC Yes – 2017 Rehab - No
- Upgrading a service to higher ampacity? 2020 NEC Yes – 2017 Rehab - No

### 230.85 Emergency Disconnects. (From the 2020 NEC)

For one- and two-family dwelling units, all service conductors shall terminate in disconnecting means having a short-circuit current rating equal to or greater than the available fault current, installed in a readily accessible outdoor location. If more than one disconnect is provided, they shall be grouped. Each disconnect shall be one of the following:

(1) Service disconnects marked as follows:

EMERGENCY DISCONNECT - SERVICE DISCONNECT

(2) Meter disconnects installed per 230.82(3) and marked as follows:

EMERGENCY DISCONNECT - METER DISCONNECT - NOT SERVICE EQUIPMENT

(3) Other listed disconnect switches or circuit breakers on the supply side of each service disconnect that are suitable for use as service equipment and marked as follows:

EMERGENCY DISCONNECT - NOT SERVICE EQUIPMENT

Markings shall comply with 110.21(B).

One of the early questions we have received, pertains to whether a separate ground and neutral would be required when installing these disconnects, i.e.: the installations of subpanels. Officials should take note that the NEC offers three options for compliance. The only method that requires the disconnect to be marked as "Service Equipment" would be the only one that would require the installation of separate grounds and neutrals from that disconnect to the feeder panel in the interior of the dwelling.

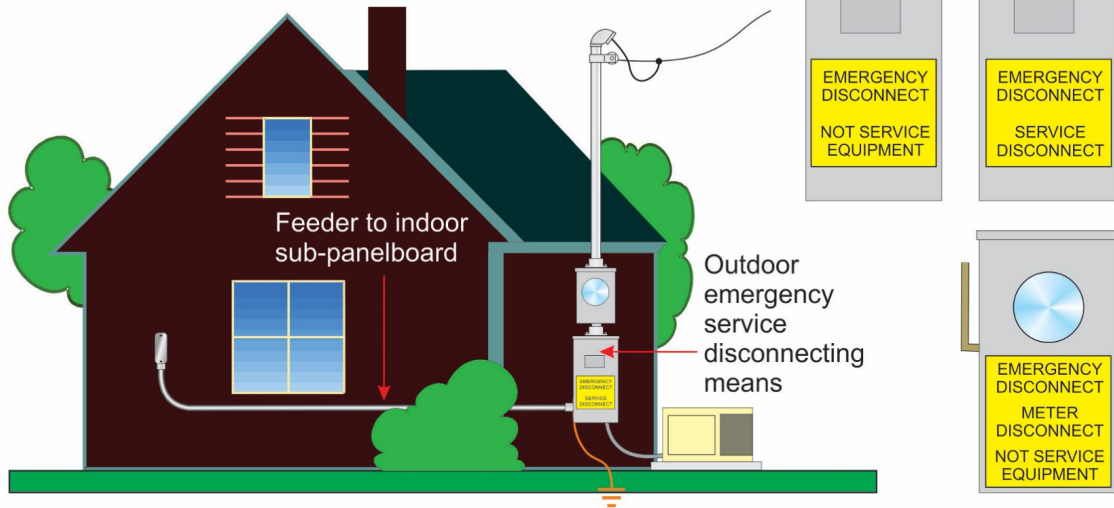
See illustrations on the next page:

## 230.85 Exterior Emergency Disconnect(s) for Dwelling Units



All one- and two-family dwelling unit service conductors shall terminate in disconnecting means having a short-circuit current rating equal to or greater than the available fault current, installed in a **readily accessible outdoor location**

If more than one disconnect, required to be grouped

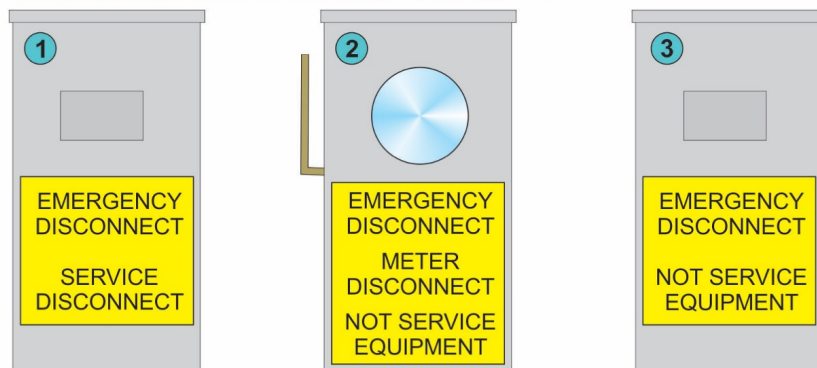


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## 230.85 Exterior Emergency Disconnect(s) for Dwelling Units



All one- and two-family dwelling unit service conductors shall terminate in disconnecting means installed in a **readily accessible outdoor location** (grouped if more than one disconnect)



Each disconnect shall be one of the following:

- 1 Service disconnects marked as follows: **EMERGENCY DISCONNECT, SERVICE DISCONNECT**
- 2 Meter disconnects installed per 230.82(3) and marked as follows: **EMERGENCY DISCONNECT, METER DISCONNECT, NOT SERVICE EQUIPMENT**
- 3 Other listed disconnect switches or circuit breakers on the supply side of each service disconnect that are suitable for use as service equipment and marked as follows: **EMERGENCY DISCONNECT, NOT SERVICE EQUIPMENT**

Another common call to code assistance. GFCI protection on AC systems up to 50A. Just signed into effect on April 4, 2023. The Electrical Subcode committee voted to postpone this as per TIA 20-19 and TIA-23-3 in NFPA. No GFCI required on AC condensers until 2026. No variation is required.

**210.8(F) Outdoor Outlets. (From the 2020 NEC)**

All outdoor outlets for dwellings, other than those covered in 210.8(A)(3), Exception to (3), that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less, shall have ground-fault circuit-interrupter protection for personnel.

Exception No. 1:

Ground-fault circuit-interrupter protection shall not be required on lighting outlets other than those covered in 210.8(C).

Exception No. 2:

Ground-fault circuit-interrupter protection shall not be required for listed HVAC equipment. This exception shall expire September 1, 2026.



**State of New Jersey**  
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**PHILIP D. MURPHY**  
*Governor*

**LT. GOVERNOR SHEILA Y. OLIVER**  
*Commissioner*

February 24, 2023

RE: GFCI incompatibility with certain types of HVAC equipment

Dear Construction Official:

In October of 2022, the Code Assistance staff alerted you and your electrical subcode official(s) to this issue via a Construction Code Communicator (CCC) article, "Tentative Interim Amendments (TIAs) 13 and 19 - Where are We?" on page 21 of the fall 2022 edition <https://www.nj.gov/dca/divisions/codes/resources/ccc.html> (attached). To be specific, as jurisdictions throughout the country adopted the 2020 National Electrical Code (NEC – NFPA 70), it was discovered repeated tripping of GFCI breakers on newly installed HVAC units, tracing it to GFCI device incompatibility with certain types of HVAC equipment. As more reports came in from builders, contractors, and inspectors of A/C units repeatedly shutting off, NFPA decided to postpone enforcement of Section 210.8(F) with the development and approval of TIA-13. This TIA added to the body of text that this requirement would become effective on January 1, 2023. TIA-19 was crafted understanding that these issues still exist, so the text from TIA-13 which postpones enforcement for GFCI on HVAC equipment was moved to create an Exception 2, and the enforcement date was moved again, this time to September 1, 2026.

NFPA, through two TIAs, have demonstrated that this item should not have been added to model code until compatibility issues were resolved. As the CCC article noted, the six-month grace period did buy some time but did not permit the DCA to propose a timely fix, such as TIA-19, by last day of March 5, 2023. The Department does intend to adopt this TIA within N.J.A.C. 5:23-3.16 to extend the enforcement date of this item at 210.8(F). Until that time, please continue to approve plans designed in accordance with the 2020 NEC and TIA-19 (attached).

Sincerely,

Edward M. Smith

Director

Division of Codes and Standards



## Tentative Interim Amendments 13 and 19 – Where are we?

As you know, the 2020 edition of the National Electrical Code (NEC, aka NFPA 70) is now adopted as of September 6, 2022, for new construction projects. Within that adoption, the first nine Tentative Interim Amendments (TIA) were included. If you don't already have TIA 1-9 printed in your books, please be sure to add them. Since the initial review of the 2020 NEC by the Department, 11 more TIAs have been added. All 20 can be viewed at <https://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/Codes-and-Standards>.

As discussed in the Summer 2021 CCC, an issued TIA automatically becomes a part of the next edition of the standard and is then subject to all of the procedures of the standards development process. This means that the 20 TIA would be included in the 2023 NEC. In a perfect world, NFPA would follow this process, and all TIAs would be held until the next edition of the code. This would make the code uniform and predictable.

However, this is not the case. If you look at the back of the cover page in your NEC, you will see the list of TIA that have been published within your book. The purpose of this article is to discuss two TIA which have been published revising Section 210.8(F), Ground-Fault Circuit-Interrupter Protection for Personnel, Outdoor Outlets, TIA 13 and 19:

- TIA-13 -- [https://www.nfpa.org/assets/files/AboutTheCodes/70/TIA\\_70\\_20\\_13.pdf](https://www.nfpa.org/assets/files/AboutTheCodes/70/TIA_70_20_13.pdf)
- TIA-19 -- [https://www.nfpa.org/assets/files/AboutTheCodes/70/TIA\\_70\\_20\\_19.pdf](https://www.nfpa.org/assets/files/AboutTheCodes/70/TIA_70_20_19.pdf)

As you will see, both TIAs relate to HVAC equipment. The issue came to light after several jurisdictions that adopted the 2020 NEC discovered repeated tripping of GFCI breakers on newly installed HVAC units, tracing it to GFCI device incompatibility with certain types of HVAC equipment. As more reports came in from builders, contractors, and inspectors of A/C units repeatedly shutting off, NFPA decided to postpone enforcement of Section 210.8(F) with the development and approval of TIA-13. This TIA added to the body of text that this requirement would become effective on January 1, 2023. TIA-19, was crafted understanding that these issues still exist, so the text from TIA-13 which postpones enforcement for GFCI on HVAC equipment was moved to create an Exception 2, and the enforcement date was moved again, this time to September 1, 2026.

From the above, it's clear that this item should not have been added to model code until compatibility issues were resolved. But that was not the case, so here we are trying to inform you on the next steps. It is worth noting that we are in the six-month grace period between the 2017 and 2020 NEC, so all projects involving this type of work should be permitted to utilize the 2017 text for this requirement. The Department will follow up with a code change proposal to acknowledge and adopt the final TIA on this subject, TIA-19, within NJAC 5:23-3.16.

Source: Scott Borsos  
Code Assistance Unit  
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## Identifying Anodeless Risers

It has been brought to our attention that there are installers supplying and installing what they think are anodeless risers for plastic gas piping installed underground pursuant to the 2018 International Fuel Gas Code (IFGC) 403.6.1 and International Residential Code (IRC) G2414.6.1; and the 2021 IFGC 403.5.1 and IRC G2414.5.1. However, many of the risers being utilized are not actually anodeless risers. This means that they require anode bags to be placed in the ground to protect the risers. It seems many suppliers do not have the necessary anode bags in stock, and some inspectors are not requiring that the anode bag be placed in the ground before backfilling the area with the riser pursuant to the manufacturer's installation instructions. As a result, depending on the conditions of the soil, there have been risers which should have had anode bags that have corroded and are now leaking gas.

It is very easy to tell if the particular riser requires an anode bag once you know what to look for. If the riser shows plastic piping at the base of it, then it is an anodeless riser. If it does not, then it requires an anode bag. Please refer to the provided pictures to see the difference.

*(Continued on next page)*





Tentative Interim Amendment

## NFPA<sup>®</sup> 70<sup>®</sup>

### *National Electrical Code<sup>®</sup>*

#### 2020 Edition

**Reference:** 210.8(F) and Exception No. 2(new)

**TIA 20-19**

(SC 22-8-16 / TIA Log #1653)

Pursuant to Section 5 of the NFPA *Regulations Governing the Development of NFPA Standards*, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 70<sup>®</sup>, *National Electrical Code<sup>®</sup>*, 2020 edition. The TIA was processed by the NEC Code-Making Panel 2, and the NEC Correlating Committee, and was issued by the Standards Council on August 12, 2022, with an effective date of September 1, 2022.

1. *Revise paragraph 210.8(F) to read as follows:*

**210.8(F) Outdoor Outlets.**

All outdoor outlets for dwellings, other than those covered in 210.8(A)(3), Exception to (3), that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less, shall have ground-fault circuit-interrupter protection for personnel. ~~This requirement shall become effective on January 1, 2023, for mini-split type heating/ventilating/air conditioning (HVAC) equipment and other HVAC units employing power conversion equipment as a means to control compressor speed.~~

~~Informational Note: *Power conversion equipment* is the term used to describe the components used in HVAC equipment that is commonly referred to as a variable speed drive. The use of power conversion equipment to control compressor speed differs from multistage compressor speed control.~~

~~*Exception No. 1: Ground-fault circuit-interrupter protection shall not be required on lighting outlets other than those covered in 210.8(C).*~~

~~*Exception No. 2: Ground-fault circuit-interrupter protection shall not be required for listed HVAC equipment. This exception shall expire September 1, 2026.*~~

**Issue Date:** August 12, 2022

**Effective Date:** September 1, 2022

(Note: For further information on NFPA Codes and Standards, please see [www.nfpa.org/docinfo](http://www.nfpa.org/docinfo))

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NATIONAL FIRE PROTECTION ASSOCIATION





Tentative Interim Amendment

## NFPA<sup>®</sup> 70<sup>®</sup>

### *National Electrical Code<sup>®</sup>*

#### **2023 Edition**

**Reference:** 210.8(F) and Exception No. 2(new)

**TIA 23-3**

*(SC 22-8-17 / TIA Log #1654)*

**Note:** Text of the TIA was issued and approved for incorporation into the document prior to printing.

1. *Revise paragraph 210.8(F) to read as follows:*

**210.8(F) Outdoor Outlets.**

For dwellings, all outdoor outlets, other than those covered in 210.8(A), Exception No. 1, including outlets installed in the following locations, and supplied by single-phase branch circuits rated 150 volts or less to ground, 50 amperes or less, shall be provided with GFCI protection:

- (1) Garages that have floors located at or below grade level
- (2) Accessory buildings
- (3) Boathouses

If equipment supplied by an outlet covered under the requirements of this section is replaced, the outlet shall be supplied with GFCI protection.

*Exception No. 1: GFCI protection shall not be required on lighting outlets other than those covered in 210.8(C).*

*Exception No. 2: GFCI protection shall not be required for listed HVAC equipment. This exception shall expire September 1, 2026.*

**Issue Date:** August 12, 2022

**Effective Date:** September 1, 2022

**(Note: For further information on NFPA Codes and Standards, please see [www.nfpa.org/docinfo](http://www.nfpa.org/docinfo))**

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