



# NATIONAL FIRE PROTECTION ASSOCIATION

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## MEMORANDUM

**TO:** NEC® Code-Making Panel 2

**FROM:** Sarah Caldwell, *Committee Administrator*

**DATE:** October 2, 2020

**SUBJECT:** NEC® Proposed TIA No. 1529 **FINAL TC BALLOT RESULTS**

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The public comment circulation has passed, therefore, according to 5.6(a) in the NFPA Regs, the final results show this TIA **HAS** achieved the ¾ majority vote needed on both Ballot Item No. 1 (**Technical Merit**) and Ballot Item No. 2 (**Emergency Nature**).

**15 Eligible to Vote**  
**1 Not Returned** (*Harman*)

### Technical Merit:

0 Abstentions  
 12 Agree (*w/comment: Abbassi, Humphrey, McCamish, Pavese, Reyes*)  
 2 Disagree (*Campolo, Domitrovich*)

### Emergency Nature:

0 Abstentions  
 12 Agree (*w/comment: Abbassi, Humprey*)  
 2 Disagree (*Campolo, Domitrovich*)

There are two criteria necessary to pass ballot [(1) simple majority (2) affirmative vote of ¾ of ballots received]. Both questions must pass ballot in order to recommend that the Standards Council issue this TIA.

(1) In all cases, an affirmative vote of at least a simple majority of the total membership eligible to vote is required.

$$[15 \text{ eligible} \div 2 = 7.5 = \mathbf{(8)}]$$

(2) The number of affirmative votes needed to satisfy the ¾ requirement is **11**.  
 (15 eligible to vote - 1 not returned - 0 abstentions = 14 × 0.75 = 10.5)

Ballot comments are attached for your review.

The Regs at 1.6.2.(c) state: An appeal relating to a proposed Tentative Interim Amendment that has been submitted for processing pursuant to Section 5.2 shall be filed no later than 5 days after the notice of the TIA final ballot results are published in accordance with 4.2.6.

**Appeal Closing Date** for this TIA is **October 9, 2020**.

**NFPA 70®-2020 Edition**  
**National Electrical Code®**

**TIA Log No.: 1529**

**Reference:** 210.8(F)

**Comment Closing Date: September 23, 2020**

**Submitter:** Donald Cook, Shelby County, AL Development Services

[www.nfpa.org/70](http://www.nfpa.org/70)

*1. Revise 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 for ductless mini-split-type heating/ventilating/air-conditioning (HVAC) equipment and other HVAC units employing power conversion equipment as a means to control compressor speed on January 1, 2023.

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 multi-stage compressor speed control.

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

**Substantiation:** This expansion of GFCI protection in the 2020 NEC to cover exterior outlets on dwelling units other than just those rated 125V is a necessary enhancement to safety. Code Making Panel 2 supported the expansion of GFCI protection to cover outdoor outlets rated 250V based on the electrocution of a young boy who came in contact with the energized enclosure of an outdoor HVAC unit. However recent field experience with new installations performed in accordance with the 2020 NEC has demonstrated some random opening of the GFCI devices protecting ductless mini splits. It has also become apparent that random opening may also occur with other equipment employing power conversion equipment controlling the speed of the compressor.

The purpose of this TIA is not to eliminate the GFCI protection but provide time for the industry to understand and address the field tripping on ductless mini splits and units containing power conversion equipment. This TIA extends the date of enforcement for the industry to address the present tripping issues that are occurring in the field on these specific equipment types.

**Emergency Nature:** The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification of the action.

While the 2020 NEC text clearly enhances safety of electrical workers, HVAC technicians and the general public, the application of the newly revised requirements in 210.8 (F) inadvertently has an unintended consequence on ductless mini split systems and other units employing power conversion equipment. Without this TIA, designers, installers, AHJs, and consumers are forced to choose between a compliant and an operational installation. Additional time is necessary for the industry to resolve the operational aspects of these specific types of equipment while retaining the enhanced safety benefit for other outdoor installations.

- A. The standard contains an error or an omission that was overlooked during the regular revision process.**
- B. The NFPA Standard contains a conflict within the NFPA Standard or with another NFPA Standard.**
- C. The proposed TIA intends to correct a previously unknown existing hazard.**
- D. The proposed TIA intends to offer to the public a benefit that would lessen a recognized (known) hazard or ameliorate a continuing dangerous condition or situation.**
- E. The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public.**
- F. The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification for the action.**

NEC Panel 2 TIA 1529 Ballot Final Report  
Election:70\_A2022\_NEC\_P02\_Log1529\_tiaballot  
Results by Revision

**QUESTION NO. 1: I AGREE with the TECHNICAL MERITS of the Proposed TIA Log No. 1529 to revise 210.8(F).**

**Eligible to Vote: 15**

**Not Returned : 1**

Thomas L. Harman

**Vote Selection**

**Agree**

**Votes Comments**

12

David W. Johnson

Agree

Mark Daniel Cook

Agree

Fred Neubauer

Agree

Christopher J. Pavese

EI supports this TIA in support of allowing the industry to find resolution to the incompatibilities between the protective devices required as a. Result of the changes to 210.8 in the 2020 NEC and the HVAC equipment they now serve.

John McCamish

This temporary modification allows the industry time to modify their equipment to comply with the new requirement, while not completely eliminating the requirement which is necessary in the interest of safety.

Charles L. Boynton

Agree

Alan Manche

Agree

David G. Humphrey

The proposed TIA recognizes an unforeseen problem with the equipment in question, most notably the unwanted tripping of GFCI devices due to a manufacturing issue. The TIA if acted upon favorably would allow industry time to correct the issue.

Cesar Lujan

Agree

Frederick P. Reyes

UL continues to support the application of GFCI protection while recognizing the need to align operational attributes of utilization equipment. There are currently existing and new installations where ground fault protected branch circuits effectively supply mini-split HVAC equipment as well as variable speed drive (VSD) loads such as 240Vac VSD pool pumps. While some loads of this type have worked without issue, it is acknowledged that not all mini-splits-type HVAC equipment can operate within the limits of GFCI's and additional work is needed to address this issue.

Nehad El-Sherif

Agree

Mathher Abbassi

I agree to delay this requirement to give manufacturers adequate time to address the leakage issue with the mini-split units.

**Disagree**

2

Thomas A. Domitrovich

The submitter has not offered compelling evidence of a compatibility issue outside of stating that some ductless mini splits randomly trip GFCIs. In light of the fact that this requirement was put in place due to direct loss of life, more data and research should be brought to this Code Making Panel to justify the removal of this life saving technology especially outside of the normal vetting that will soon begin as part of the NEC® 2023 revision process. More evidence and data must be provided to support removal of GFCIs as part of 210.8(F).

Steve Campolo

NO, the NEC should not be changed to delay the Code rule. Comment: As sated in the TIA rationale, the substantiation for the Code rule was based on an electrocution of a young boy. Had a GFCI been installed, that boy would be alive. Changing two units to types that do not trip GFCI's seems like a safer alternative. This would also inform the manufacturer of the high leakage units that they are not acceptable when installed within the purview of the NEC. However, both the manufacturer and UL should have been well aware of this from the PI stage of the Code process. In the mentioned teleconference (above) we also learned that the "industry" opts to use variable speed motors to improve efficiency that is required by other government standards. I suggest that the efficiency standards be postponed for three years to allow for less efficient motors and the industry to re-tool rather than deliberately allow exposure to (abnormal) leakage currents that could possibly electrocute someone else. Additionally, all standards that allow greater than 5ma leakage (at 120V to 250V) need to be changed and the notion of deliberately "leaking" noise to ground be eliminated as Equipment Grounding Conductors are (normally) non-current carrying.

**Abstain**

0

**QUESTION NO. 2: I AGREE that the subject is of an EMERGENCY NATURE for one or more of the reasons noted in the Instructions box.**

**Eligible to Vote: 15**

**Not Returned : 1**

Thomas L. Harman

**Vote Selection**

**Agree**

**Votes Comments**

12

David W. Johnson

The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification for the action.

Mark Daniel Cook

F

Fred Neubauer

Agree

Christopher J. Pavese

F

John McCamish

The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process.

Charles L. Boynton

F

Alan Manche

F

David G. Humphrey

This equipment is being installed currently under NFPA 70 2020 edition and is resulting in some new equipment causing unwanted tripping of gfci devices. If the TIA is not acted upon favorably the actions of local code officials will likely set aside both formally and informally the 2020 NEC requirement for gfci protection at outdoor mini-split type units, and perhaps all types of exterior hvac equipment due to public pressure. These local actions may extend years beyond the time this issue is corrected by industry.

Cesar Lujan

F.

Frederick P. Reyes

Emergency Nature Letter Code - F

Nehad El-Sherif

F

Mathher Abbassi

Ce train equipment has the leakage current that will prevent the equipment from being served by a GFCI.

**Disagree**

2

Thomas A. Domitrovich

Evidence of a widespread issue was not demonstrated by the submitter. NEMA does not feel that compelling information was provided to warrant the immediate removal of the life safety provisions of 210.8(F) which was substantiated based upon loss of life.

Steve Campolo

NO, there is no emergency nature requiring a reduction in safety. Comment: Based on a teleconference with CMP-2 members as well as the submitter of the TIA and several manufacturers of this type of equipment, we have learned that the tripping of the GFCI is due (in part) to the variable speed motor technology that produces electrical noise which finds its way to ground. This has been observed in two installations of the same type of unit. We also learned that other variable speed motors do not exhibit this problem as well two speed motors also do not exhibit this problem. Rather than reducing electrical safety, a substitution of these two units with the other types that do not trip the GFCI seems to be a safer alternative to solve this specific non-emergency.

**Abstain**

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