



DEPARTMENT OF ADMINISTRATIVE SERVICES

PROPOSED CHANGE OF THE CONNECTICUT STATE
BUILDING CODE AND FIRE SAFETY CODE

DATE SUBMITTED: 5/31/2021

CODE INFORMATION

Proposed change to: ☒ Building Code ☐ Fire Safety Code

Code section(s): 2020 NEC Section 210.8(F)

PROPONENT INFORMATION

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PROPOSAL INFORMATION

Description of change and reason for change (attach additional information as needed):

See attached

Proposed text change, addition or deletion (attach additional information as needed):

See attached

Supporting data and documents (attach additional information as needed)

See attached

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Robert Glass

Proponent's Signature

Robert Glass

Printed Name

PLEASE EMAIL (PREFERRED) TO DAS.CodesStandards@CT.GOV OR MAIL OR FAX (SEE BELOW)

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12/29/16

Description of change:

Delete or modify section 210.8(F) concerning new requirements for GFCI protection on outdoor electrical circuits that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less.

Proposed text change:

- (1) Delete this section in its entirety; or if deleting in entirety is not acceptable to the committee, then
- (2) Revise 210.8 (F) as follows: (F) Outdoor Outlets. All outdoor general-purpose receptacles ~~outlets~~ for other than dwellings units, ~~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.

Justification:

As of 4/1/2021, 9 of 22 states that have either adopted the 2020 NEC or are in process of adopting have deleted/modified section 210.8(F) so that it does not apply to HVAC equipment. These include OR, WA, TX, ND, SD, MA, IA, UT, and NC.

The substantiation used by MA when they deleted section 210.8(F) noted "This addition in the 2020 NEC has not been substantiated. The loss experience supporting this addition to the NEC was based on untrained and unqualified work on an air-conditioning condenser that ended up energized and a thereby caused a boy who jumped a fence and contacted the housing to become electrocuted. GFCI protection saves countless lives and certainly has its place. However, it is a fool's errand to imply to the public that improper work can be rendered essentially safe by waving the GFCI magic wand. For example, contact between two circuit conductors will never trip a GFCI. CMP 2 came within one vote of rejecting this; Massachusetts needs to set it aside and await proper support."

TX adopted the 2020 NEC in November 2020, however, the Texas Department of Licensing and Regulation issued an emergency injunction against enforcing these Section 210.8(F) requirements on 5/19/2021 (<https://www.tdlr.texas.gov/pressrelease/2021-05-20%20NEC%20delay.pdf>), while the TDLR has begun work on non-emergency rulemaking to implement this change on a permanent basis. This came about after a rash of nuisance trips of new Heating, Ventilating and Air-Conditioning (HVAC) equipment in new homes over the last month. These nuisance trips are manufacturer generic as both multiple HVAC manufacturers equipment AND multiple GFCI manufacturers product were involved.

Reference documents from each of these states are accessible through the links below.

The industry has experienced many nuisance trips of GFCI breakers operating with inverter-driven HVAC equipment. 100% of all inverter-driven HVAC products that we are aware of when paired with a GFCI breaker have had nuisance tripping. In addition, we have heard claims from the Leading Builders of America (LBA) of single-stage and two-stage HVAC products with nuisance tripping when paired with GFCI breakers.

A Temporary Interim Amendment (TIA) request has been submitted to NFPA requesting a delay in the effective date of this requirement (as it relates to inverter-driven HVAC equipment) to allow the industry to (1) update certification requirements in UL943 and UL/CSA 60335-2-40 to address leakage current testing requirements at higher frequencies and (2) to allow manufacturers to make revisions to their equipment (both GFCI breakers and HVAC equipment manufacturers) to comply with new requirements. Another TIA request has been submitted to NFPA by the National Association of Home Builders (NAHB) on 5/14/2021 requesting a delay in implementation of these requirements for all HVAC equipment due to the nuisance tripping incidents experienced with single-stage and 2-stage equipment.

A CDC report published in 2020 states, “During 2004–2018, an average of 702 heat-related deaths occurred in the United States annually.”¹ This CDC report noting 10,527 heat-related deaths in a 15-year period (702/year), or 6,220 deaths where heat was the primary factor (414/year). That CDC report states the following on p732, “Past studies have demonstrated a relationship between ambient temperatures and mortality (8). **In particular, extreme heat exposure can exacerbate certain chronic medical conditions, including hypertension and heart disease (4,5). In addition, medications that are typically used to treat these chronic medical conditions such as beta-blockers, diuretics, and calcium-channel blockers, can interfere with thermoregulation and result in a reduced ability to respond to heat stress (5).**” [Emphasis added]. (NOTE: The numbers in parenthesis are reference numbers in the CDC document). Health related concerns are obviously significant with hundreds of deaths recorded each year reported by the CDC associated due to heat exposure (lack of cooling). It is not infeasible to assume these statistics could worsen if GFCI circuit breakers cause nuisance tripping, causing loss of air conditioning, during the heat of summer.

The recommendation before you today is to delete section 201.8(F) in its entirety when Connecticut adopts the 2020 NEC (as has been done or proposed by MA, IA, NC, SD, and UT). If deleting in entirety is not acceptable to the committee, then the recommendation is to modify the requirement as proposed (text taken from OR amendment).

¹*Heat-Related Deaths – United States, 2004-2018*, Centers For Disease Control and Prevention, Morbidity and Mortality Weekly Report, Vol. 69, No. 24, June 19, 2020. Page 732
<https://www.cdc.gov/mmwr/volumes/69/wr/pdfs/mm6924a1-H.pdf>

Reference documents:

IA: Section 210.8(F) was deleted in an amendment after adoption

<https://dps.iowa.gov/divisions/electrical-examining-board/electrical-code-updates>

MA: GFCI protection was removed for outdoor, non-receptacle outlets during the adoption process.

<https://www.mass.gov/doc/527-cmr-12-massachusetts-electrical-code-amendments/download>

NC (Proposed): Section 210.8(F) is proposed to be deleted when the 2020 edition is adopted later this year.

<https://www.ncosfm.gov/media/2068/open>

ND: An exception is provided for mini-split & A/C units with DC invertors. The installer is required to fill out a form including information describing what the contractor has done to resolve the issue.

<https://www.ndseb.com/>

OR: Section 210.8(F) was modified to only apply to outdoor receptacles for other than dwelling units.

<https://www.oregon.gov/bcd/codes-stand/Documents/21oesc-table1-E-2021April.pdf>

SD: Section 210.8(F) was not adopted with the 2020 NEC.

https://dlr.sd.gov/electrical/documents/adopted_code_2020.pdf

TX: An emergency rule delayed the requirements of Section 210.8(F) effective May 20, 2021.

<https://www.tdlr.texas.gov/electricians/elec.htm>

<https://www.tdlr.texas.gov/Agendas/Commagendas/agenda051821.htm>

UT (Proposed): Section 210.8(F) is proposed to be deleted when the 2020 edition goes into effect.

<https://www.utah.gov/pmn/files/668869.pdf>

WA: The state is delaying enforcement of Section 210.8(F) until January 1, 2023.

https://lni.wa.gov/licensing-permits/_docs/Elc2011.pdf

