National Fire Protection Association

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WORKING DRAFT OF CODE-MAKING PANEL MEETING OUTPUT

CONTENT NOT FINAL –SUBJECT TO REVISION PRIOR TO LETTER BALLOT AND PUBLICATION OF FIRST DRAFT REPORT

Document: National Electrical Code®

Revision Cycle: A2019

Meeting Date: January 8 – 20, 2018

Committee Activity: Input Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Code-Making Panel's First Draft Meetings. It includes draft copies of the First Revisions and any Global Revisions.

It is being made available to Committee members for the purpose of facilitating early review, particularly for those Committee members who may be seeking input from their respective organizations in preparation for the Letter Ballot of the Committee.

First Revision No. 7675-NFPA 70-2018 [New Section after 408.18(B)]

(C) Connections.

Each section of equipment that requires rear or side access to make field connections shall be so marked by the manufacturer on the front. Section openings requiring rear or side access shall comply with 110.26. Load terminals for field wiring shall comply with (1) or (2) as applicable.

(1) Equipment Grounding and Grounded Circuit Conductors. Load terminals for field wiring shall be so located that it is not necessary to reach across uninsulated ungrounded bus in order to make connections.

(2) Ungrounded Conductors. Load terminals for ungrounded conductors shall be so located that it is not necessary to reach across energized uninsulated bus in order to make connections. Bus on the line side of service, branch, or feeder disconnects is considered energized with respect to its associated load side circuits.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
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Submittal Date: Tue Jan 09 14:34:30 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 has been made aware of gear on the market that previously required installers to reach across busbars to make some connections, including equipment grounding connections. Recent clarifying changes made by CMP 9 to 408.3(D) prohibit such practice. To accommodate these changes, the gear in question is now being furnished with instructions to access the rear of the equipment. These practices only involve equipment covered in Part II of Article 408. By this revision, CMP 9 is modifying 408.18 to clarify that 110.26 clearances apply in such cases.

CMP 9 is instituting these changes in the interest of protecting worker safety. Full Compliance with NFPA 70E is always recommended by CMP 9. Equipment should not be worked on while energized unless requirements of NFPA 70E are followed and appropriate precautions are taken. This change is to provide an additional level of safety where permitted energized work is authorized.

The key to this first revision is to provide code rules for when justifiable energized work needs to be performed, and that nevertheless minimize the possibility that a dropped tool will result in injury or damage or both.

CMP 9 changed the wording of 408.3(D) in the 2017 edition by deleting the word “line” and thereby intended to reach this result by assuring that the reaching-across-bus prohibition would apply to buswork even if de-energized. It did so because it was aware of widespread reports of such practices continuing.

Nevertheless, this gear is often installed against a wall, precluding rear access. This is a problem that will only intensify as market pressures on scarce electrical room areas steadily limit the placement of switchgear in the middle of a floor.

This first revision, by clarifying that a pretense of avoiding energized work will not allow evasion of the configuration requirement, will do two things. First, it will drive manufacturing practices in the direction of producing gear that will not be subject to the risk, and second, it will provide fully compliant work spaces in all directions of required access for existing (or even future) designs requiring rear and side access. Both of these developments will diminish worker hazards.

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Neutral and equipment grounding terminals will only be permitted with direct access achievable without reaching across uninsulated ungrounded buswork. This requirement will not depend on any presumed state of energization. Requirements for phase connections are less restrictive, with the reach-across prohibition only applying to energized uninsulated bus. Line-side bus in such cases is to be presumed as energized with respect to the load side circuits supplied.

CMP 9 concludes that this initiative will definitively clarify the applicable requirements.

Response Message:

Public Input No. 2737-NFPA 70-2017 [Section No. 408.18]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7659-NFPA 70-2018 [New Section after 408.22]

408.23 Power Monitoring and Energy Management Equipment.

The requirements of 312.8(B) shall apply.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
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Submittal Date: Tue Jan 09 13:12:43 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 agrees that the initiative in 312.8(B) taken in the 2017 NEC should be extended to switchboard and switchgear applications. CMP 9 notes that panelboards are, strictly speaking, only the buswork; which is then customarily enclosed within a cabinet. Therefore there is no need to place this topic in Part I of Article 408 because enclosed panelboards are already covered by 312.8(B). However, switchboards and switchgear are not covered, and should be. Therefore CMP 9 places this material in Part II of Article 408 as 408.23.

Response Message:

Public Input No. 2747-NFPA 70-2017 [New Section after 408.3(G)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7663-NFPA 70-2018 [New Section after 408.5]

408.6 Short-Circuit Current Rating.

Switchboards, switchgear, and panelboards shall be rated for not less than the available short-circuit current. The available short-circuit current and the date the calculation was performed shall be documented and made available to those authorized to inspect the installation.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
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Zip:
Submittal Date: Tue Jan 09 13:29:44 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 agrees that the available short-circuit current at a location within the scope of Article 408 is a number that needs to be determined and then made available to the AHJ. This is a number that can vary unpredictably over time, and therefore the AHJ must have a way to know when the determination was done. The new requirement will accomplish this objective without creating a marking that may well have diminishing value over time. CMP 9 is placing the text in a vacant part (Section 6) of Part I of the article, where it will apply generally.

Response Message:

Public Input No. 2431-NFPA 70-2017 [New Section after 408.16]

Public Input No. 3711-NFPA 70-2017 [New Part after I.]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7511-NFPA 70-2018 [Section No. 312.5(C)]

(C) Cables.

Where cable is used, each cable shall be secured to the cabinet, cutout box, or meter socket enclosure.

Exception No. 1 : Cables with entirely nonmetallic sheaths shall be permitted to enter the top of a surface-mounted enclosure through one or more nonflexible raceways not less than 450 mm (18 in.) and not more than 3.0 m (10 ft) in length, provided all of the following conditions are met:

(1) Each cable is fastened within 300 mm (12 in.), measured along the sheath, of the outer end of the raceway.

(2) The raceway extends directly above the enclosure and does not penetrate a structural ceiling.

(3) A fitting is provided on each end of the raceway to protect the cable(s) from abrasion and the fittings remain accessible after installation.

(4) The raceway is sealed or plugged at the outer end using approved means so as to prevent access to the enclosure through the raceway.

(5) The cable sheath is continuous through the raceway and extends into the enclosure beyond the fitting not less than 6 mm (¼ in.).

(6) The raceway is fastened at its outer end and at other points in accordance with the applicable article.

(7) Where installed as conduit or tubing, the cable fill does not exceed the amount that would be permitted for complete conduit or tubing systems by Table 1 of Chapter 9 of this Code and all applicable notes thereto. ~~Note 2 to the tables in Chapter 9 does not apply to this condition.~~

Informational Note: See Table 1 in Chapter 9, including Note 9, for allowable cable fill in circular raceways. See 310.15(B)(3)(a) for required ampacity reductions for multiple cables installed in a common raceway.

Exception No. 2: Single conductors and multi-conductor cables shall be permitted to enter enclosures in accordance with 392.46(A) or (B).

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SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 09:39:41 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This section is revised to add the following: Exception 2: Single Conductors and multi-conductor cables as covered in 392.46(A) and (B). CMP-9 recognizes the need for the new exception based on creation of two First Revisions on PI 2372 & PI 2375 by CMP-8.

CMP 9 prefers the current text in Condition 4 based on the historical substantiation of this exception. The purpose of the sealing and plugging the raceway is to prevent access to the panel by debris or other unintended mechanical means, such as a stray fish wire. The current language provides clear intent for the AHJ to approve the type method of sealing or plugging required.

The informational note is not necessary as the AHJ has the authority to approve duct seal or other

methods to seal or plug the raceway.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 8, 2018	NEC-CMP Panel 09	Note 2 should not be shown as new text

Public Input No. 2369-NFPA 70-2017 [Section No. 312.5(C)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7536-NFPA 70-2018 [Section No. 312.6 [Excluding any Sub-Sections]]

Conductors at terminals or conductors entering or leaving cabinets ~~or~~ , cutout boxes and ~~the like~~ meter socket enclosures shall comply with 312.6(A) through (C).

Exception: Wire-bending space in enclosures for motor controllers with provisions for one or two wires per terminal shall comply with 430.10(B).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Mon Jan 08 11:56:15 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This section is revised to make the content match the scope of that article. This revision makes clear that “meter socket enclosures” are subject to the requirements in 312.6.

Response Message:

Public Input No. 2652-NFPA 70-2017 [Section No. 312.6 [Excluding any Sub-Sections]]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7538-NFPA 70-2018 [Section No. 312.6(B)(2)]

FOR CODE-MAKING PANEL USE ONLY
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(2) Conductors Entering or Leaving Opposite Wall.

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Table 312.6(B) shall apply where the conductor does enter or leave the enclosure through the wall opposite its terminal.

Exception No. 1: Where the distance between the wall and its terminal is in accordance with Table 312.6(A), a conductor shall be permitted to enter or leave an enclosure through the wall opposite its terminal, provided the conductor enters or leaves the enclosure where the gutter joins an adjacent gutter that has a width that conforms to Table 312.6(B) for the conductor.

Exception No. 2: A conductor not larger than 350 kcmil shall be permitted to enter or leave an enclosure containing only a meter socket(s) through the wall opposite its terminal, provided the distance between the terminal and the opposite wall is not less than that specified in Table 312.6(A) and the terminal is a lay-in type or removable lug with integral mounting tang , where the terminal is either of the following:

(a) Directed toward the opening in the enclosure and within a 45 degree angle of directly facing the enclosure wall

(b) Directly facing the enclosure wall and offset not greater than 50 percent of the bending space specified in Table 312.6(A)

Informational Note: *Offset* is the distance measured along the enclosure wall from the axis of the centerline of the terminal to a line passing through the center of the opening in the enclosure.

Table 312.6(B) Minimum Wire-Bending Space at Terminals

Wire Size (AWG or kcmil)		Wires per Terminal							
		1		2		3		4 or More	
All Other Conductors	Compact Stranded AA-8000 Aluminum Alloy Conductors (See Note 3.)	mm	in.	mm	in.	mm	in.	mm	in.
14–10	12–8	Not specified		—	—	—	-	—	—
8	6	38.1	1½	—	—	—	-	—	—
6	4	50.8	2	—	—	—	-	—	—
4	2	76.2	3	—	—	—	-	—	—
3	1	76.2	3	—	—	—	-	—	—
2	1/0	88.9	3½	—	—	—	-	—	—
1	2/0	114	4½	—	—	—	-	—	—
1/0	3/0	140	5½	140	5½	178	7	—	—
2/0	4/0	152	6	152	6	190	7½	—	—
3/0	250	165[a]	6½[a]	165[a]	6½[a]	203	8	—	—
4/0	300	178[b]	7[b]	190[c]	7½[c]	216[a]	8½[a]	—	—
250	350	216[d]	8½[d]	~~229~~ 216[d]	8½[d]	~~254~~ 229[b]	9[b]	254	10
300	400	254[e]	10[e]	254[d]	10[d]	279[b]	11[b]	305	12
350	500	305[e]	12[e]	305[e]	12[e]	330[e]	13[e]	356[d]	14[d]
400	600	330[e]	13[e]	330[e]	13[e]	356[e]	14[e]	381[e]	15[e]
500	700–750	356[e]	14[e]	356[e]	14[e]	381[e]	15[e]	406[e]	16[e]
600	800–900	381[e]	15[e]	406[e]	16[e]	457[e]	18[e]	483[e]	19[e]
700	1000	406[e]	16[e]	457[e]	18[e]	508[e]	20[e]	559[e]	22[e]
750	—	432[e]	17[e]	483[e]	19[e]	559[e]	22[e]	610[e]	24[e]
800	—	457	18	508	20	559	22	610	24

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Wire Size (AWG or kcmil)		Wires per Terminal							
		1		2		3		4 or More	
All Other Conductors	Compact Stranded AA-8000 Aluminum Alloy Conductors (See Note 3.)	mm	in.	mm	in.	mm	in.	mm	in.
900	—	483	19	559	22	610	24	610	24
1000	—	508	20	—	—	—	-	—	-
1250	—	559	22	—	—	—	-	—	-
1500	—	610	24	—	—	—	-	—	-
1750	—	610	24	—	—	—	-	—	-
2000	—	610	24	—	—	—	-	—	-

Notes:

1. Bending space at terminals shall be measured in a straight line from the end of the lug or wire connector in a direction perpendicular to the enclosure wall.

2. For removable and lay-in wire terminals intended for only one wire, bending space shall be permitted to be reduced by the following number of millimeters (inches):

[a]12.7 mm (½ in.)

[b]25.4 mm (1 in.)

[c]38.1 mm (1½ in.)

[d]50.8 mm (2 in.)

[e]76.2 mm (3 in.)

3. This column shall be permitted to determine the required wire-bending space for compact stranded aluminum conductors in sizes up to 1000 kcmil and manufactured using AA-8000 series electrical grade aluminum alloy conductor material in accordance with 310.106(B).

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 12:01:57 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This section is revised to add “or removable lug with integral mounting tang” in order to permit the same bending distance for removable lugs as permitted for lay-in lugs, as found in the existing requirements in Table 312.6(B) Note 2. The installation practice for these two types of connectors is similar and should benefit from the same bending provisions.

Table 312.6(B) Minimum Wire Bending Space at Terminals is revised to correct a mistake made in converting inches to millimeters in the 2002 code cycle.

In the 250 kcmil row, 8 ½ in. should be is 216 mm and 9 in. is 229 mm.

Response Message:

Public Input No. 347-NFPA 70-2017 [Section No. 312.6(B)(2)]

Public Input No. 1128-NFPA 70-2017 [Section No. 312.6(B)(2)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7539-NFPA 70-2018 [Section No. 312.8(B)]

(B) Power Monitoring ~~Equipment~~ or Energy Management Equipment .

The wiring space of enclosures for switches or overcurrent devices shall be permitted to contain power monitoring or energy management equipment where all of the following conditions are met:

(1) The power monitoring ~~equipment~~ or energy management equipment is identified as a field installable accessory as part of the listed equipment, or is a listed kit evaluated for field installation in switch or overcurrent device enclosures.

(2) The total area of all conductors, splices, taps, and equipment at any cross section of the wiring space does not exceed 75 percent of the cross-sectional area of that space.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Street Address:
City:
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Submittal Date: Mon Jan 08 12:09:15 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This section is being revised to add the term “Energy Management Equipment”. CMP 9 recognizes that listed energy management equipment's primary function is to monitor, measure and control circuits by automatic means within the wiring space of a cabinet, cutout box or a meter socket enclosure is similar to that of power monitoring equipment. Both types of equipment present the same concern and is governed by the same requirements.

Response Message:

Public Input No. 2670-NFPA 70-2017 [Section No. 312.8(B)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7543-NFPA 70-2018 [Section No. 314.16 [Excluding any Sub-Sections]]

Boxes and conduit bodies shall be of an approved size to provide free space for all enclosed conductors. In no case shall the volume of the box, as calculated in 314.16(A), be less than the fill calculation as calculated in 314.16(B). The minimum volume for conduit bodies shall be as calculated in 314.16(C).

The provisions of this section shall not apply to terminal housings supplied with motors or generators.

Informational Note: For volume requirements of motor or generator terminal housings, see 430.12.

Boxes and conduit bodies enclosing conductors 4 AWG or larger shall also comply with the provisions of 314.28._ Outlet and device boxes shall also comply with 314.24.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
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Submittal Date: Mon Jan 08 12:43:53 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: It should be noted that for a period of forty three years (1947 NEC to 1990 NEC), a device in a box only required a single volume allowance.

During the 1990 code cycle CMP 9 addressed the volume issues associated with deeper devices such as GFCI's and dimmers. Several submitters proposed two unique volume allowance deductions, one volume allowance deduction for standard devices and a double volume allowance deduction for larger devices. CMP 9 determined that the double volume allowance for all devices was the best practice for the industry since the boxes are often installed before the devices are selected.

Between the 2005 and 2008 code cycles CMP 9 convened a task group to evaluate the volume requirements for large devices and equipment flush mounted in outlet and device boxes. The result was the expansion of Section 314.24 Depth of Boxes.

The current requirements in these two sections address the concerns of the submitter; however, CMP 9 added text to 314.16 requiring compliance to Section 314.24.

Response Message:

Public Input No. 1536-NFPA 70-2017 [Section No. 314.16(B)(4)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7540-NFPA 70-2018 [Section No. 314.16(A)]

(A) Box Volume Calculations.

The volume of a wiring enclosure (box) shall be the total volume of the assembled sections and, where used, the space provided by plaster rings, domed covers, extension rings, and so forth, that are marked with their volume or are made from boxes the dimensions of which are listed in Table 314.16(A). Where a box is provided with one or more securely installed barriers, the volume shall be apportioned to each of the resulting spaces. Each barrier, if not marked with its volume, shall be considered to take up 8.2 cm^3 (½ in^3) if metal, and 16.4 cm^3 (1.0 in^3) if nonmetallic.

(1) Standard Boxes.

The volumes of standard boxes that are not marked with their volume shall be as given in Table 314.16(A).

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SUBJECT TO REVISION - NOT FOR PUBLICATION

(2) Other Boxes.

Boxes 1650 cm^3 (100 $in.^3$) or less, other than those described in Table 314.16(A), and nonmetallic boxes shall be durably and legibly marked by the manufacturer with their volume(s). Boxes described in Table 314.16(A) that have a volume larger than is designated in the table shall be permitted to have their volume marked as required by this section.

Table 314.16(A) Metal Boxes

Box Trade Size			Minimum Volume			Maximum Number of Conductors* (arranged by AWG size)						
mm	in.	-		cm^3	$in.^3$	18	16	14	12	10	8	6
100 × 32	(4 × 1¼)	round/octagonal	205	12.5	8	7	6	5	5	5	2	
100 × 38	(4 × 1½)	round/octagonal	254	15.5	10	8	7	6	6	5	3	
100 × 54	(4 × 2⅛)	round/octagonal	353	21.5	14	12	10	9	8	7	4	
100 × 32	(4× 1¼)	square	295	18.0	12	10	9	8	7	6	3	
100 × 38	(4 × 1½)	square	344	21.0	14	12	10	9	8	7	4	
100 × 54	(4 × 2⅛)	square	497	30.3	20	17	15	13	12	10	6	
120 × 32	(4 11/16 × 1¼)	square	418	25.5	17	14	12	11	10	8	5	
120 × 38	(4 11/16 × 1½)	square	484	29.5	19	16	14	13	11	9	5	
120 × 54	(4 11/16 × 2⅛)	square	689	42.0	28	24	21	18	16	14	8	
75 × 50 × 38	(3 × 2 × 1½)	device	123	7.5	5	4	3	3	3	2	1	
75 × 50 × 50	(3 × 2 × 2)	device	164	10.0	6	5	5	4	4	3	2	
75× 50 × 57	(3× 2 × 2¼)	device	172	10.5	7	6	5	4	4	3	2	
75 × 50 × 65	(3 × 2 × 2½)	device	205	12.5	8	7	6	5	5	4	2	
75 × 50 × 70	(3 × 2 × 2¾)	device	230	14.0	9	8	7	6	5	4	2	
75 × 50 × 90	(3 × 2 × 3½)	device	295	18.0	12	10	9	8	7	6	3	
100 × 54 × 38	(4 × 2⅛ × 1½)	device	169	10.3	6	5	5	4	4	3	2	
100 × 54 × 48	(4 × 2⅛ × 1⅞)	device	213	13.0	8	7	6	5	5	4	2	
100 × 54 × 54	(4 × 2⅛ × 2⅛)	device	238	14.5	9	8	7	6	5	4	2	
95 × 50 × 65	(3¾ × 2 × 2½) masonry box/gang		230	14.0	9	8	7	6	5	4	2	
95 × 50 × 90	(3¾ × 2 × 3½) masonry box/gang		344	21.0	14	12	10	9	8	7	4	
min. 44.5 depth	FS — single cover/gang (1¾)		221	13.5	9	7	6	6	5	4	2	
min. 60.3 depth	FD — single cover/gang (2⅜)		295	18.0	12	10	9	8	7	6	3	
min. 44.5 depth	FS — multiple cover/gang (1¾)		295	18.0	12	10	9	8	7	6	3	
min. 60.3 depth	FD — multiple cover/gang (2⅜)		395	24.0	16	13	12	10	9	8	4	

*Where no volume allowances are required by 314.16(B)(2) through (B)(5).

FOR CODE-MAKING PANEL USE ONLY
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Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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City:
State:
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Submittal Date: Mon Jan 08 12:36:17 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This table is revised to correct an error during the 2017 code cycle where the word “gang” was removed from masonry, FS and FD boxes. During the code cycle CMP 9 created FR 2406 in response to PI (2692) which proposed to add the word “gang” to most of the other boxes, and it left the word alone on masonry, FS and FD boxes because it was consistent with that objective. CMP 9 rejected the addition of the word “gang” to the other boxes and never attempted to make any change to the existing table, where the use of that word is correct.

Response Message:

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7531-NFPA 70-2018 [Section No. 314.16(B)(5)]

(5) Equipment Grounding Conductor Fill.

Where ~~one or more~~ up to four equipment grounding conductors or equipment bonding jumpers enter a box, a single volume allowance in accordance with Table 314.16(B) shall be made based on the largest equipment grounding conductor or equipment bonding jumper ~~present in~~ entering the box. ~~Where an additional set of equipment grounding conductors, as permitted by 250.146(D) , is present in the box, an additional volume allowance shall be made~~ A ¼ volume allowance shall be made for each additional equipment grounding conductor or equipment bonding jumper that enters the box, based on the largest equipment grounding conductor ~~in the additional set~~ or equipment bonding conductor.

Submitter Information Verification

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Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 11:23:50 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The requirement for the volume allowance for equipment grounding conductors and equipment bonding jumpers is revised to add an additional ¼ volume allowance to the existing volume allowance. As such, this amount is counted in installations with more than four equipment grounding conductors or equipment bonding conductors.

This change eliminates the need to specifically address the equipment grounding conductors permitted by 250.146(D).

Response Message:

Public Input No. 1663-NFPA 70-2017 [Section No. 314.16(B)(5)]

Public Input No. 1799-NFPA 70-2017 [Section No. 314.16(B)(5)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7546-NFPA 70-2018 [Section No. 314.17]

314.17 Conductors Entering Boxes, Conduit Bodies, or Fittings.

Conductors entering boxes, conduit bodies, or fittings shall be protected from abrasion and shall comply with 314.17(A) through (D).

(A) Openings to Be Closed.

Openings through which conductors enter shall be closed in ~~an approved manner~~ a manner identified for the application .

(B) ~~Metal~~ Boxes and Conduit Bodies.

~~Where metal boxes or conduit bodies are installed with messenger-supported wiring, open wiring on insulators, or concealed knob-and-tube wiring, conductors shall enter through insulating bushings or, in dry locations, through flexible tubing extending from the last insulating support to not less than 6 mm (1⁄4 in.) inside the box and beyond any cable clamps. Where nonmetallic-sheathed cable or multiconductor Type UF cable is used, the sheath shall extend not less than 6 mm (1⁄4 in.) inside the box and beyond any cable clamp. Except as provided in 300.15(C) , the wiring shall be firmly secured to the box or conduit body. Where raceway or cable is installed with metal boxes or conduit bodies, the raceway or cable shall be secured to such boxes and conduit bodies.~~

~~**(C)** Nonmetallic Boxes and Conduit Bodies.~~

~~Nonmetallic boxes and conduit bodies shall be suitable for the lowest temperature-rated conductor entering the box. Where nonmetallic boxes and conduit bodies are used with~~

The installation of the conductors in boxes and conduit bodies shall comply with (1) through (4):

(1) Conductors Entering Through Individual Holes or Through Flexible Tubing. For messenger-supported wiring, open wiring on insulators, or concealed knob-and-tube wiring, the conductors shall enter the box through individual holes. In installations where metal boxes or conduit bodies are used with conductors unprotected by flexible tubing, the individual openings shall be provided with insulating bushings. Where flexible tubing is used to enclose the conductors, the tubing shall extend from the last insulating support to not less than 6 mm (¼ in.) inside the box or conduit body and beyond any cable clamp. The wiring method shall be secured to the box or conduit body.

(2) Conductors Entering Through Cable Clamps. Where ~~nonmetallic-sheathed cable or multiconductor Type UF cable is~~ cable assemblies with nonmetallic sheathes are used, the sheath shall extend not less than 6 mm (1⁄4 in.) inside the box and beyond any cable clamp. ~~In all instances, all permitted wiring methods~~ Except as provided in 300.15(C), the wiring method shall be secured to the ~~boxes.~~ box or conduit body

Exception: Where nonmetallic-sheathed cable ~~or multiconductor Type UF cable~~ is used with single gang nonmetallic boxes not larger than a nominal size 57 mm × 100 mm (2¼ in. × 4 in.) mounted in walls or ceilings, and where the cable is fastened within 200 mm (8 in.) of the box measured along the sheath and where the sheath extends through a cable knockout not less than 6 mm (¼ in.), securing the cable to the box shall not be required. Multiple cable entries shall be permitted in a single cable knockout opening.

(

~~D)~~

3) Conductors Entering Through Raceways. *Where the raceway is complete between boxes, conduit bodies, or both and encloses individual conductors or nonmetallic cable assemblies or both, the conductors or cable assemblies shall not be required to be additionally secured. Where raceways enclose cable assemblies as provided in 300.15(C), the cable assembly shall not be required to be additionally secured within the box or conduit body.*

(4) Temperature Limitation. *Nonmetallic boxes and conduit bodies shall be suitable for the lowest temperature-rated conductor entering the box or conduit body.*

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

(C) Conductors 4 AWG or Larger.

Installation shall comply with 300.4(G).

Informational Note: See 110.12(A) for requirements on closing unused cable and raceway knockout openings.

Supplemental Information

File Name	Description	Approved
Panel_9_FR-7546_314.17_leg_changes.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 13:06:29 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The word “approved” means that the manner is acceptable to the Authority Having Jurisdiction. The use of the word “identified” will increase field consistency of enforcement because the methods used will need to be shown to be “recognizable as suitable for the specific use.”

CMP 9 recognizes that cable designs with nonmetallic sheaths or coverings need to be addressed in these requirements. CMP 9 prefers not to itemize all cable types. Additionally, cable assemblies that enter into a box or conduit body from a complete raceway system should not be required to be secured to the enclosure. This rewording does not address conductors protected by flexible tubing entering boxes in dry locations. The limitations of boxes in uses other than dry locations are adequately covered in 314.15.

CMP 9 will use this First Revision as an opportunity to rewrite Sections 314.17(B) and (C) to improve usability.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 8, 2018	NEC-CMP Panel 09	(3) and (4) should not be italicized.

Public Input No. 2564-NFPA 70-2017 [Section No. 314.17(A)]

Public Input No. 1388-NFPA 70-2017 [Section No. 314.17(A)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7554-NFPA 70-2018 [Section No. 314.19]

314.19 Boxes Enclosing Flush Devices or Flush Equipment .

Boxes used to enclose flush devices or flush equipment shall be of such design that the devices or equipment will be completely enclosed on the back and sides and substantial support for the devices or equipment will be provided. Screws for supporting the box shall not also be used to attach a device or equipment .

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Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 14:01:10 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 recognizes there is equipment other than “devices” that may be flush mounted in boxes. Utilization Equipment is defined as “Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes.” The use of the more general term “equipment” instead of “utilization equipment” is preferred because it covers all types of equipment that might be installed in boxes. The insertion of the word “the” ahead of “back and sides” is for editorial clarification.

Response Message:

Public Input No. 704-NFPA 70-2017 [Section No. 314.19]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7555-NFPA 70-2018 [Section No. 314.23(B)(1)]

(1) Nails and Screws.

Nails and screws, where used as a fastening means, shall secure boxes by using brackets on the outside of the enclosure, or by using mounting holes in the back or in ~~a single side~~ one or more sides of the enclosure, or they shall pass through the interior within 6 mm (¼ in.) of the back or ends of the enclosure. Screws shall not be permitted to pass through the box unless exposed threads in the box are protected using approved means to avoid abrasion of conductor insulation. Mounting holes made in the field shall be approved.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 14:07:37 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This First Revision recognizes a common installation practice to secure boxes on more than one side of the box.

Response Message:

Public Input No. 4320-NFPA 70-2017 [Section No. 314.23(B)(1)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

WORKING DRAFT OF CMP MEETING OUTPUT - NATIONAL ELECTRICAL CODE - NFPA 70
JANUARY 8 - 20, 2018 - SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7706-NFPA 70-2018 [Section No. 314.23(D)(2)]

(2) Support Wires.

The installation shall comply with ~~the provisions of~~ 300.11(A). The enclosure shall be secured, using identified methods, to ceiling support wire(s), including any additional support wire(s) installed for ceiling support. Support wire(s) used for enclosure support shall be fastened at each end so as to be taut within the ceiling cavity.

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Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 16:34:44 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The phrase "the provisions of" is unnecessary and redundant and is being deleted to increase usability.
Response Message:

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7559-NFPA 70-2018 [Section No. 314.23(H)(2)]

(2) Conduit.

A box supporting lampholders or luminaires, or wiring enclosures within luminaires used in lieu of boxes in accordance with 300.15(B), shall be supported by rigid or intermediate metal conduit stems. For stems longer than 450 mm (18 in.), the stems shall be connected to the wiring system with ~~flexible fittings~~ listed swivel hangers suitable for the location. At the luminaire end, the conduit(s) shall be threaded wrenchtight into the box, wiring enclosure, or identified hubs.

Where supported by only a single conduit, the threaded joints shall be prevented from loosening by the use of set-screws or other effective means, or the luminaire, at any point, shall be at least 2.5 m (8 ft) above grade or standing area and at least 900 mm (3 ft) measured horizontally to the 2.5 m (8 ft) elevation from windows, doors, porches, fire escapes, or similar locations. A luminaire supported by a single conduit shall not exceed 300 mm (12 in.) in any horizontal direction from the point of conduit entry.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jan 08 14:35:15 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The term “listed swivel hangers” is the appropriate term for this section and CMP 9 has issued a First Revision based on this editorial change.

Response Message:

Public Input No. 425-NFPA 70-2017 [Section No. 314.23(H)(2)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7560-NFPA 70-2018 [Section No. 314.25 [Excluding any Sub-Sections]]

In completed installations, each box shall have a cover, faceplate, lampholder, or luminaire canopy, except where the installation complies with 410.24(B). Screws used for the purpose of attaching covers, or other equipment, to the box shall be either machine screws matching the thread gauge ~~or~~ and size that is integral to the box or shall be in accordance with the manufacturer's instructions.

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Street Address:
City:
State:
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Submittal Date: Mon Jan 08 14:40:37 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: For a screw to properly mate with the female threads in the box, the screw must match both the thread gauge (pitch) and the size (diameter). If you only match one or the other, as the current rule states, the screw will not properly mate with the threads in the box.

Response Message:

Public Input No. 1378-NFPA 70-2017 [Section No. 314.25 [Excluding any Sub-Sections]]

Public Input No. 1530-NFPA 70-2017 [Section No. 314.25 [Excluding any Sub-Sections]]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7563-NFPA 70-2018 [Section No. 314.27(C)]

(C) Boxes at Ceiling-Suspended (Paddle) Fan Outlets.

Outlet boxes or outlet box systems used as the sole support of a ceiling-suspended (paddle) fan shall be listed, shall be marked by their manufacturer as suitable for this purpose, and shall not support ceiling-suspended (paddle) fans that weigh more than 32 kg (70 lb). For outlet boxes or outlet box systems designed to support ceiling-suspended (paddle) fans that weigh more than 16 kg (35 lb), the required marking shall include the maximum weight to be supported.

~~Where spare, separately switched, ungrounded conductors are provided to a ceiling-mounted outlet box, in~~ Outlet boxes mounted in the ceilings of habitable rooms of dwelling occupancies in a location acceptable for the future installation of a ceiling-suspended (paddle) fan ~~in~~

~~one-~~

~~family, two-family, or~~

~~multifamily~~

~~dwellings, the outlet box or outlet box system~~ shall be listed for the sole support of ~~a~~ ceiling-suspended (paddle) ~~fan~~ fans .

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City:
State:
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Submittal Date: Mon Jan 08 14:50:39 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 recognizes that paddle fans can now be installed on outlet boxes with two current carrying conductors with the advent of the remote-controlled paddle fans. Note that this does not require a “fan box” in installations where the ceiling fan is installed and the box is not used as the sole support of the ceiling fan.

Response Message:

Public Input No. 2427-NFPA 70-2017 [Section No. 314.27(C)]

Public Input No. 1166-NFPA 70-2017 [Section No. 314.27(C)]

Public Input No. 707-NFPA 70-2017 [Section No. 314.27(C)]

First Revision No. 7570-NFPA 70-2018 [Section No. 314.28(E)(1)]

(1) Installation.

Power distribution blocks installed in boxes shall be listed. ~~Power distribution blocks installed on the line side of the service equipment shall be listed and marked "suitable for use on the line side of service equipment" or equivalent.~~

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Submittal Date: Mon Jan 08 15:45:44 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This First Revision revises the section to remove requirement regarding power distribution blocks used on the line side of service equipment.

It is expected that CMP 10 will add a general requirement in Article 230, so the recommended "First Revision" is to remove this "Service Equipment" requirement. This First Revision should be reconsidered should CMP 10 not make this revision.

Response Message:

Public Input No. 1531-NFPA 70-2017 [Section No. 314.28(E)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7745-NFPA 70-2018 [Section No. 314.29]

314.29 Boxes, Conduit Bodies, and Handhole Enclosures to Be Accessible.

Boxes, conduit bodies, and handhole enclosures shall be installed so that ~~the~~ wiring contained in them can be rendered accessible in accordance with (A), (B) and (C):

(A) In Buildings and Other Structures. Boxes and conduit bodies shall be installed so the contained wiring can be accessed without removing any part of the building or structure~~, or, in underground circuits,~~

(B) Underground. Underground boxes and handhole enclosures shall be installed so they are accessible without excavating sidewalks, paving, earth, or other substance that is to be used to establish the finished grade.

Exception: Listed boxes and handhole enclosures shall be permitted where covered by gravel, light aggregate, or noncohesive granulated soil if their location is effectively identified and accessible for excavation.

(C) Behind Luminaires. *Boxes and conduit bodies installed behind a wall or ceiling, other than suspended ceilings, that are not associated with a luminaire shall be installed so the contained wiring can be accessed without the removal of a luminaire or a portion thereof.*

Exception: Boxes or conduit bodies not associated with a luminaire shall be permitted to be located where access is achieved by the removal of a luminaire or portion thereof. The location of the box or conduit body shall be effectively identified and the luminaire shall be capable of removal without damage to the building structure or finish. The box or conduit body shall be accessible and located within 150 mm (6 in.) of the opening.

Supplemental Information

File Name	Description	Approved
Panel_9_FR-7745_314.29_leg_changes.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:00:23 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This first revision adds a restriction for locating boxes and conduit bodies behind luminaires. This restriction will not apply to locations above suspended ceilings. It will prohibit the location of boxes and conduit bodies behind luminaires in such a manner that the removal of the luminaire is required to access the box or conduit body.

An exception provides an option, similar to the existing exception for underground enclosures, to permit boxes and conduit bodies to be located behind the luminaire where: 1) the location of the box is effectively identified, 2) the luminaire can be removed without damage to the building structure or finish, and 3) the box or conduit body is in an accessible location within 150 mm of the opening. The panel

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considered a greater distance for a larger opening, but determined that the 150 mm rule is appropriate.

The requirement wording also clarifies that the removal of a portion of a luminaire is permitted. This first revision also restructures the text into lettered subsections for clarity.

Response Message:

Committee Notes:

Date	Submitted By
Jan 10, 2018	NEC-CMP Panel 09 (C) should not be italicized

Public Input No. 1803-NFPA 70-2017 [Section No. 314.29]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7578-NFPA 70-2018 [Section No. 314.30 [Excluding any Sub-Sections]]

Handhole enclosures shall be designed and installed to withstand all loads likely to be imposed on them. They shall be identified for use in underground systems.

Informational Note: See ANSI/SCTE 77-~~2002~~ 2013 , *Specification for Underground Enclosure Integrity*, for additional information on deliberate and nondeliberate traffic loading that can be expected to bear on underground enclosures.

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Submitter Full Name: NEC-CMP Panel 09
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State:
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Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This First Revision updates the standard reference to the proper date (ANSI/SCTE 77 2013).

Response Message:

Public Input No. 823-NFPA 70-2017 [Section No. 314.30 [Excluding any Sub-Sections]]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7579-NFPA 70-2018 [Section No. 314.40(D)]

(D) Equipment Grounding Conductor Provisions.

A means shall be provided in each metal box for the connection of an equipment grounding conductor. The means shall be permitted to be a tapped hole or equivalent.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
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City:
State:
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Submittal Date: Mon Jan 08 16:21:17 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: This First Revision revises the title of this section to clarify the scope of the requirements in the section.

Response Message:

Public Input No. 1677-NFPA 70-2017 [Section No. 314.40(D)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7607-NFPA 70-2018 [Section No. 404.1]

404.1 Scope.

~~The provisions of this article apply to~~ This article covers all switches, switching devices, and circuit breakers used as switches operating at 1000 volts and below, unless specifically referenced elsewhere in this *Code* for higher voltages.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Tue Jan 09 08:40:03 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: All NEC references to cited text necessarily point to the provisions within that cited text. For this reason CMP 9 is recommending to the Correlating Committee that the phrase “the provisions of” be deleted from the scope because it is inherently redundant. CMP 9 is basing its action on PI 2711 because PI 2641 uses the word “shall,” which is used for requirements and is inappropriate for an article scope. Both PIs have the same general objective.

Response Message:

Public Input No. 2641-NFPA 70-2017 [Section No. 404.1]

Public Input No. 2711-NFPA 70-2017 [Section No. 404.1]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7634-NFPA 70-2018 [Section No. 404.10]

404.10 Mounting of General-Use Snap Switches, Dimmers, and Control Switches .

(A) Surface Type.

~~Snap switches~~ General-use snap switches, dimmers, and control switches used with open wiring on insulators shall be mounted on insulating material that separates the conductors at least 13 mm (½ in.) from the surface wired over.

(B) Box Mounted.

Flush-type general-use snap switches, dimmers, and control switches mounted in boxes that are set back of the finished surface as permitted in 314.20 shall be installed so that the extension plaster ears are seated against the surface. Flush-type ~~snap switches~~ devices mounted in boxes that are flush with the finished surface or project from it shall be installed so that the mounting yoke or strap of the ~~switch~~ device is seated against the box. Screws used for the purpose of attaching a ~~snap switch~~ device to a box shall be of the type provided with a listed ~~snap switch~~ device , or shall be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions.

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SUBJECT TO REVISION - NOT FOR PUBLICATION

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City:
State:
Zip:
Submittal Date: Tue Jan 09 10:41:09 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: Historically, this section has addressed general use snap switches. However, the topics covered need to apply equally to dimmer switches and other switches with comparable control functions such as occupancy sensors that are located in similar environments. This first revision uses the term "general-use snap switch" for clarity because that is the way the device is covered and defined in Article 100, and many other Code provisions [such as 430.109(C)(2)] rely on this definition.

Response Message:

Public Input No. 1367-NFPA 70-2017 [Section No. 404.10]

First Revision No. 7642-NFPA 70-2018 [Section No. 404.12]

404.12 Grounding of Enclosures.

Metal enclosures for switches or circuit breakers shall be connected to an equipment grounding conductor as specified in Part IV of Article 250. Metal enclosures for switches or circuit breakers used as service equipment shall comply with the provisions of Part V of Article 250. Where nonmetallic enclosures are used with metal raceways or metal-armored cables, ~~provision shall be made for connecting the equipment grounding conductor(s).~~ they shall comply with 314. 3 Exception No. 1 or No. 2.

Except as covered in 404.9(B), Exception No. 1, nonmetallic boxes for switches shall be installed with a wiring method that provides or includes an equipment grounding conductor.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 10:55:52 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 concludes that the references to Article 250 are both correct and appropriate, however, the final sentence will benefit by using a reference to the exceptions in 314.3 because it offers a significant simplification of the wording.

Response Message:

Public Input No. 1713-NFPA 70-2017 [Section No. 404.12]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7674-NFPA 70-2018 [Section No. 404.14]

404.14 Rating and Use of Switches.

Switches shall be listed and used within their ratings and as indicated in 404.14(A) through (F).

Informational Note No. 1: For switches on signs and outline lighting, see 600.6.

Informational Note No. 2: For switches controlling motors, see 430.83, 430.109, and 430.110.

(A) Alternating-Current General-Use Snap Switch.

A form of general-use snap switch suitable only for use on ac circuits for controlling the following:

(1) Resistive and inductive loads not exceeding the ampere rating of the switch at the voltage applied

(2) Tungsten-filament lamp loads not exceeding the ampere rating of the switch at 120 volts

(3) Electric discharge lamp loads not exceeding the marked ampere and voltage rating of the switch

(4) Motor loads not exceeding 80 percent of the ampere rating of the switch at its rated voltage

(5) Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied

(B) Alternating-Current or Direct-Current General-Use Snap Switch.

A form of general-use snap switch suitable for use on either ac or dc circuits for controlling the following:

(1) Resistive loads not exceeding the ampere rating of the switch at the voltage applied.

(2) Inductive loads not exceeding 50 percent of the ampere rating of the switch at the applied voltage. Switches rated in horsepower are suitable for controlling motor loads within their rating at the voltage applied.

(3) Tungsten-filament lamp loads not exceeding the ampere rating of the switch at the applied voltage if T-rated.

(4) Electonic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding the ampere rating of the switch at the voltage applied.

(C) CO/ALR Snap Switches.

Snap switches rated 20 amperes or less directly connected to aluminum conductors shall be listed and marked CO/ALR.

(D) Alternating-Current ~~Specific~~ General -Use Snap Switches Rated for 347 Volts.

Snap switches rated 347 volts ac shall be listed and ~~shall be~~ used only for controlling the loads permitted by (D)(1)~~ and~~ , (D)(2), and (D)(3) .

(1) Noninductive Loads.

Noninductive loads other than tungsten-filament lamps not exceeding the ampere and voltage ratings of the switch.

(2) Inductive Loads.

Inductive loads not exceeding the ampere and voltage ratings of the switch. Where particular load characteristics or limitations are specified as a condition of the listing, those restrictions shall be observed regardless of the ampere rating of the load.

(3) Lighting Loads.

Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied.

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The ampere rating of the switch shall not be less than 15 amperes at a voltage rating of 347 volts ac. Flush-type snap switches rated 347 volts ac shall not be readily interchangeable in box mounting with switches identified in 404.14(A) and (B).

(E) Dimmer and Electronic Control Switches.

General-use dimmer switches shall be used only to control permanently installed incandescent luminaires unless listed for the control of other loads and installed accordingly. Other electronic control switches, such as timing switches and occupancy sensors, shall be used to control permanently connected loads. They shall be marked by their manufacturer with their current and voltage ratings, and used for loads that do not exceed their ampere rating at the voltage applied.

(F) Cord- and Plug-Connected Loads.

Where a snap switch or control device is used to control cord- and plug-connected equipment on a general-purpose branch circuit, each snap switch or control device controlling receptacle outlets or cord connectors that are supplied by permanently connected cord pendants shall be rated at not less than the rating of the maximum permitted ampere rating or setting of the overcurrent device protecting the receptacles or cord connectors, as provided in 210.21(B).

Informational Note: See 210.50(A) and 400.10(A)(1) for equivalency to a receptacle outlet of a cord connector that is supplied by a permanently connected cord pendant.

Exception: Where a snap switch or control device is used to control not more than one receptacle on a branch circuit, the switch or control device shall be permitted to be rated at not less than the rating of the receptacle.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 14:15:01 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 concludes that the time has come to require switches to be listed. They are generally only available in this form, and they possess internal construction characteristics that inspection authorities cannot generally evaluate.

CMP 9 is adding coverage of acceptable uses of ac general-use snap switches that have become customary but as yet not included in the list governing such uses. Specifically, CMP 9 inserts, as (3), coverage of electric-discharge lighting loads. This moves the motor circuit applications (previously in third position) to (4). CMP 9 also inserts, as (5), coverage of electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamps with their associated drivers.

CMP 9 is modernizing the rules for ac or dc general-use snap switches by adding coverage of electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamps with their associated drivers.

CMP 9 is modernizing the rules for ac snap switches rated for 347 volts by adding coverage of electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamps with their associated drivers. In addition, the expression in the title, “Specific-Use” is changed to “General-Use” because these switches are not specific to any particular load characteristic beyond operating within the voltage and current ratings of the switch.

In addition to the presently recognized use for dimming, other electronic control switches are now common and as yet not recognized in this subsection. CMP 9 is updating the coverage in this paragraph accordingly. These switches are being developed with enabled wireless controls, and they do not conform to generic load ratings (such as Resistive, Inductive, or Tungsten) as covered in (A) and (B).

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This means that their ratings must be fully marked on them so they can be properly applied.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 10, 2018	NEC-CMP Panel 09	"The ampere rating of the switch shall not be less than 15 amperes at a voltage rating of 347 volts ac. Flush-type snap switches rated 347 volts ac shall not be readily interchangeable in box mounting with switches identified in 404.14(A) and (B)." is not new text and should not be shown as new.
Jan 10, 2018	NEC-CMP Panel 09	The comma after ratings and before and in E needs to remain.

Public Input No. 1453-NFPA 70-2017 [Section No. 404.14(D)]

Public Input No. 1452-NFPA 70-2017 [Section No. 404.14(B)]

Public Input No. 1451-NFPA 70-2017 [Section No. 404.14(A)]

Public Input No. 1454-NFPA 70-2017 [Section No. 404.14(E)]

Public Input No. 1450-NFPA 70-2017 [Section No. 404.14 [Excluding any Sub-Sections]]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7611-NFPA 70-2018 [Section No. 404.2(C)]

(C) Switches Controlling Lighting Loads.

The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit serving bathrooms, hallways, stairways, or rooms suitable for human habitation or occupancy as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations under any of the following conditions:

(1) Where conductors enter the box enclosing the switch through a raceway, provided that the raceway is large enough for all contained conductors, including a grounded conductor

(2) Where the box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials

(3) Where snap switches with integral enclosures comply with 300.15(E)

(4) Where lighting in the area is controlled by automatic means

(5) Where a switch controls a receptacle load

The grounded conductor shall be extended to any switch location as necessary and shall be connected to switching devices that require line-to-neutral voltage to operate the electronics of the switch in the standby mode and shall meet the requirements of 404.22.

Exception: The connection requirement shall become effective on January 1, 2020. It shall not apply to replacement or retrofit switches installed in locations prior to local adoption of 404.2(C) and where the grounded conductor cannot be extended without removing finish materials. The number of electronic ~~lighting~~ control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25. For the purpose of this exception, a neutral busbar, in compliance with 200.2(B) and to which a main or system bonding jumper is connected shall not be limited as to the number of electronic lighting control switches connected.

~~Informational Note: The provision for a (future) grounded conductor is to complete a circuit path for electronic lighting control devices.~~

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 08:53:05 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 is removing the word “lighting” from the phrase “the number of electronic lighting control switches” because the switches in question may be other than a lighting control switch, and the applicable product standards will describe them as simply “electronic control switches.” The exception must apply to the total number of such devices. The informational note is deleted because it is no longer necessary.

Response Message:

Public Input No. 2727-NFPA 70-2017 [Section No. 404.2(C)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7646-NFPA 70-2018 [Section No. 404.22]

404.22 Electronic ~~Lighting~~ Control Switches.

Electronic ~~lighting~~ control switches shall be listed. Electronic ~~lighting~~ control switches shall not introduce current on the equipment grounding conductor during normal operation. The requirement to not introduce current on the equipment grounding conductor shall take effect on January 1, 2020.

Exception: Electronic ~~lighting~~ control switches that introduce current on the equipment grounding conductor shall be permitted for applications covered by 404.2(C), Exception. Electronic ~~lighting~~ control switches that introduce current on the equipment grounding conductor shall be listed and marked for use in replacement or retrofit applications only.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 11:25:57 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 is removing the word “lighting” from the phrase “electronic lighting control switches” because the switches in question may supply non-lighting loads, and the applicable product standards will describe them as simply “electronic control switches.” The exception must apply to such devices regardless of whether or not they happen to control a lighting load. CMP 9 is not inserting an informational note regarding the purpose for this requirement, which the related Public Input intended as a relocation from 404.2(C), because it is no longer necessary.

Response Message:

Public Input No. 2729-NFPA 70-2017 [Section No. 404.22]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7613-NFPA 70-2018 [Section No. 404.4(C)]

(C) Switches in Tub or Shower Spaces.

Switches shall not be installed within ~~tubs~~ tub or shower spaces unless installed as part of a listed tub or shower assembly.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 08:57:59 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 is correcting an unintended change in the 2011 NEC, and that has gone undetected until this cycle. The change reworded text from that voted by CMP 9 in its action on Proposal 9-98, and that clearly applied the requirement to tub spaces. That is, the word "tub" was singular because it was being used as an adjective to modify the word "spaces." This phrasing is correct in the subsection title, but incorrect in the text of the rule. The 2011 NEC text was itself an editorial reorganization of the section material into three subsections, and no substantive change from the original text accepted in the 1993 NEC cycle was ever intended. The text of this revision reinstates the intent of that voted by CMP 9 at its meeting in the 2011 cycle.

Coincidentally, the documentation associated with another action in the 2011 NEC provides a very clear explanation of intent relative to the permitted switch location, which CMP 9 now reaffirms. Responding to Proposal 9-96 (which requested a 3-ft. separation between the switch and the tub or shower space), the panel rejected it with the following explanation:

"The submitter misunderstands the objective of this rule. It is not to prevent someone in a tub or shower from touching a switch. It is to prevent the location of switches where streams of water over the cover would be routine, eventually compromising gaskets and impairing grounding continuity. A properly installed and grounded switch immediately outside the normal shower curtain location is not intended to be considered in violation of this rule."

In making this statement, CMP 9 reaffirmed the substantiation for Comment 9-110 in the 1993 NEC cycle, which was the basis for the creation of the requirement in the first place. That substantiation also pointed to the acceptability of a switch outside the actual tub or shower space, even if very near.

The relevant consideration here is routine direct water contact with the device, and not a reaching exposure by someone in the tub or shower space. CMP 9 recognizes that "tub or shower space" is vague. A task group will be appointed to investigate and prepare a public comment concerning the proper designation of tub or shower spaces.

Response Message:

Public Input No. 3666-NFPA 70-2017 [Section No. 404.4(C)]

Public Input No. 3722-NFPA 70-2017 [Section No. 404.4(C)]

Public Input No. 3617-NFPA 70-2017 [Section No. 404.4(C)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7621-NFPA 70-2018 [Section No. 404.7]

404.7 Indicating.

General-use and motor-circuit switches, circuit breakers, and molded case switches, where mounted in an enclosure as described in 404.3, shall ~~clearly indicate~~ indicate, in a location that is visible when accessing the external operating means whether they are in the open (off) or closed (on) position.

Where these switch or circuit breaker handles are operated vertically rather than rotationally or horizontally, the up position of the handle shall be the closed (on) position.

Exception No. 1: Vertically operated double-throw switches shall be permitted to be in the closed (on) position with the handle in either the up or down position.

Exception No. 2: On busway installations, tap switches employing a center-pivoting handle shall be permitted to be open or closed with either end of the handle in the up or down position. The switch position shall be clearly indicating and shall be visible from the floor or from the usual point of operation.

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 09:30:50 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: Currently 404.7 requires switches and circuit breakers to clearly indicate whether they are in the open or closed position. The word “clearly” is a subjective term that should be avoided. Furthermore, while it may be implied, it is not specified that this indication must be visible without opening the enclosure to see the open/closed indication. This revision clarifies that the indication must be visible when accessing the operating means. Note that this revision will not affect switch operating handles behind NEMA 4X and similar enclosures with bolted covers. In such cases, the indication only applies after the cover is opened, unless the enclosure is equipped with an external operator.

Response Message:

Public Input No. 1816-NFPA 70-2017 [Section No. 404.7]

First Revision No. 7671-NFPA 70-2018 [Section No. 404.9]

404.9 ~~Provisions for~~ 9 General-Use Snap Switches, Dimmers, and Control Switches .

(A) Faceplates.

Faceplates provided for snap switches, dimmers, and control switches mounted in boxes and other enclosures shall be installed so as to completely cover the opening and, where the switch is flush mounted, seat against the finished surface.

(B) Grounding.

Snap switches, ~~including dimmer~~ dimmers, and ~~similar~~ control switches, shall be connected to an equipment grounding conductor and shall provide a means to connect metal faceplates to the equipment grounding conductor, whether or not a metal faceplate is installed. Metal faceplates shall be ~~grounded~~ bonded to the equipment grounding conductor . Snap switches, dimmers, and control switches shall be considered to be part of an effective ground-fault current path if either of the following conditions is met:

(1) The switch is mounted with metal screws to a metal box or metal cover that is connected to an equipment grounding conductor or to a nonmetallic box with integral means for connecting to an equipment grounding conductor.

(2) An equipment grounding conductor or equipment bonding jumper is connected to an equipment grounding termination of the snap switch.

Exception No. 1 to (B): Where no means exists within the ~~snap switch~~ enclosure for ~~connecting~~ bonding to the equipment grounding conductor, or where the wiring method does not include or provide an equipment grounding conductor, a snap switch without a connection to an equipment grounding conductor shall be permitted for replacement purposes only. A snap switch wired under the provisions of this exception and located within 2.5 m (8 ft) vertically, or 1.5 m (5 ft) horizontally, of ground or exposed grounded metal objects shall be provided with a faceplate of nonconducting noncombustible material with nonmetallic attachment screws, unless the switch mounting strap or yoke is nonmetallic or the circuit is protected by a ground-fault circuit interrupter.

Exception No. 2 to (B): Listed kits or listed assemblies shall not be required to be ~~connected~~ bonded to an equipment grounding conductor if all of the following conditions are met:

(1) The device is provided with a nonmetallic faceplate ~~that cannot be installed on any other type of device,~~

(2) and the device is designed such that no metallic faceplate replaces the one provided

(3) The device does not have mounting means to accept other configurations of faceplates~~,~~

(4) The device is equipped with a nonmetallic yoke~~, and~~

(5) All parts of the device that are accessible after installation of the faceplate are manufactured of nonmetallic materials~~.~~

Exception No. 3 to (B): A snap switch with integral nonmetallic enclosure complying with 300.15(E) shall be permitted without a bonding connection to an equipment grounding conductor.

(C) Construction.

Metal faceplates shall be of ferrous metal not less than 0.76 mm (0.030 in.) in thickness or of nonferrous metal not less than 1.02 mm (0.040 in.) in thickness. Faceplates of insulating material shall be noncombustible and not less than 2.54 mm (0.100 in.) in thickness, but they shall be permitted to be less than 2.54 mm (0.100 in.) in thickness if formed or reinforced to provide adequate mechanical strength.

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09

Organization: [Not Specified]

Make Editorial Changes Based on Committee Text

Street Address:

City:

State:

Zip:

Submittal Date: Tue Jan 09 14:05:26 EST 2018

Committee Statement and Meeting Notes

Committee Statement: Historically, this section has addressed general use snap switches. However, the topics covered need to apply equally to dimmer switches and other switches with comparable control functions such as occupancy sensors that are located in similar environments. The term “general use snap switch” must be retained because that is the way the device is covered and defined in Article 100, and many other Code provisions [such as 430.109(C)(2)] rely on this definition. CMP 9 is also removing the words “Provisions for” from the section title because any code rule necessarily has provisions, making the use here redundant. CMP 9 is not using the word “similar” to describe these control switches because it does not add clarity. In Exception No. 1, CMP 9 is removing the words “snap switch” from the first line because other devices are now included.

CMP 9 revises the wording that formerly required faceplates to be grounded, because that is somewhat vague and in this case needs to specify the intended electrical connection, which is to the equipment grounding conductor. CMP 9 is also changing the terminology in the exceptions to correlate with this action.

CMP 9 is closing an unintended loophole in the first condition of Exception No. 2. The existing wording focuses on the faceplate supplied with the device. The revised wording focuses on the design of the device. This will prevent an aftermarket substitution of a metal faceplate that cannot be readily bonded to an equipment grounding conductor.

Response Message:

Committee Notes:

Date	Submitted By	
Jan 11, 2018	NEC-CMP Panel 09	No new list item is being added.

Public Input No. 1034-NFPA 70-2017 [Section No. 404.9(B)]

Public Input No. 1168-NFPA 70-2017 [Section No. 404.9(B)]

Public Input No. 1366-NFPA 70-2017 [Section No. 404.9]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7655-NFPA 70-2018 [Section No. 408.3(A)]

(A) Conductors and Busbars on a Switchboard, Switchgear, or Panelboard.

Conductors and busbars on a switchboard, switchgear, or panelboard shall comply with 408.3(A)(1)~~,~~ and (A)(2) ~~, and (A)(3)~~ as applicable.

(1) Location.

Conductors and busbars shall be located so as to be free from physical damage and shall be held firmly in place.

(2)

~~– Service Panelboards, Switchboards, and Switchgear.~~

~~Barriers shall be placed in all service panelboards, switchboards, and switchgear such that no uninsulated, ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations.~~

~~Exception:~~

~~This requirement shall not apply to service panelboards with provisions for more than one service disconnect within a single enclosure as permitted in 408.36 , Exceptions 1, 2, and 3.~~

~~**(3)** Same Vertical Section.~~

Other than the required interconnections and control wiring, only those conductors that are intended for termination in a vertical section of a switchboard or switchgear shall be located in that section.

Exception: Conductors shall be permitted to travel horizontally through vertical sections of switchboards and switchgear where such conductors are isolated from busbars by a barrier.

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Supplemental Information

File Name	Description	Approved
Panel_9_FR-7655_408.3_A_leg_changes.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 12:57:57 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 provisionally deletes this material contingent on CMP 10 acting favorably on the correlating public input. CMP 9 agrees that the material should apply generically to service applications and should therefore be located in Article 230.

CMP 9 deletes this exception contingent on favorable action being taken by CMP 10 in Article 230. Therefore depending on the final actions taken by CMP 10 on this subject area, Section 408.3(A) may

need to be revisited.

Response Message:

Public Input No. 3517-NFPA 70-2017 [Section No. 408.3(A)]

Public Input No. 2676-NFPA 70-2017 [Section No. 408.3(A)(2)]

Public Input No. 732-NFPA 70-2017 [Section No. 408.3(A)(2)]

Public Input No. 1684-NFPA 70-2017 [Section No. 408.3(A)(2)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7764-NFPA 70-2018 [Section No. 408.3(D)]

(D) Terminals.

In switchboards ~~,~~ and switchgear, ~~and panelboards,~~ load terminals for field wiring ~~, including grounded circuit conductor load terminals and connections to the equipment grounding conductor bus for load equipment grounding conductors, shall be so located that it is not necessary to reach across or beyond an uninsulated ungrounded bus in order to make connections.~~ shall comply with 408.18(C).

Submitter Information Verification

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Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:36:46 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 is making this change to correlate with material being added as 408.18(C) that clarifies how rear and/or side workspace is to be provided. This is of particular concern in the event that the requirements in 408.3(D) are only met by the provision of rear and/or side access by the manufacturer. The actual requirements will now reside in Part II of the article because this issue does not apply to panelboards.

Response Message:

Public Input No. 2738-NFPA 70-2017 [Section No. 408.3]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7661-NFPA 70-2018 [Section No. 408.4(A)]

(A) Circuit Directory or Circuit Identification.

Every circuit and circuit modification shall be legibly identified as to its clear, evident, and specific purpose or use. The identification shall include an approved degree of detail that allows each circuit to be distinguished from all others. Spare positions that contain unused overcurrent devices or switches shall be described accordingly. The identification shall be included in a circuit directory that is located on the face ~~or~~ , inside of, or in an approved location adjacent to the panel door in the case of a panelboard and at each switch or circuit breaker in a switchboard or switchgear. No circuit shall be described in a manner that depends on transient conditions of occupancy.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 13:20:53 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 supports the concept that generally the more detail that is provided in a circuit directory the better in terms of meeting the safety objectives of 404.4. The existing text may frustrate that in some cases due to a lack of space. Therefore, CMP 9 is expanding the options slightly in the case of a panelboard by allowing an adjacent location that is approved for this purpose. This could include a prominently labeled notebook of circuit directories for adjacent panels that might even include graphics. CMP 9 has now made this option clearly available if desired.

Response Message:

Public Input No. 3152-NFPA 70-2017 [New Section after 408.4(A)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7693-NFPA 70-2018 [Section No. 408.56]

408.56 Minimum Spacings.

The distance between ~~bare~~ uninsulated metal parts, busbars, and ~~so forth~~ other uninsulated live parts shall not be less than specified in Table 408.56.

Where close proximity does not cause excessive heating, parts of the same polarity at switches, enclosed fuses, and so forth shall be permitted to be placed as close together as convenience in handling will allow.

Exception: The distance shall be permitted to be less than that specified in Table 408.56 at circuit breakers and switches and in listed components installed in switchboards, switchgear, and panelboards.

Table 408.56 Minimum Spacings Between Bare Metal Parts

AC or DC Voltage	Opposite Polarity Where Mounted on the Same Surface		Opposite Polarity Where Held Free in Air		Live Parts to Ground*	
	mm	in.	mm	in.	mm	in.
Not over 125 volts, nominal	19.1	¾	12.7	½	12.7	½
Not over 250 volts, nominal	31.8	1¼	19.1	¾	12.7	½
Not over 1000 volts, nominal	50.8	2	25.4	1	25.4	1

*For spacing between live parts and doors of cabinets, see 312.11(A)(1), (2), and (3).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jan 09 15:52:35 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 has replaced the wording “so forth” with “other uninsulated live parts” to craft a less subjective requirement. Note that an energized conductor is live by virtue of the definition of "live parts" in Article 100, even if insulated. The wording chosen for this edited sentence reflects that principle.

Response Message:

Public Input No. 3155-NFPA 70-2017 [Section No. 408.56]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7767-NFPA 70-2018 [Section No. 450.10(B)]

(B) Other Metal Parts.

~~Where grounded, exposed~~ Exposed non–current-carrying metal parts of transformer installations, including fences, guards, and so forth, shall be grounded and bonded under the conditions and in the manner specified for electrical equipment and other exposed metal parts in Parts V, VI, and VII of Article 250.

Submitter Information Verification

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Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:44:59 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: 450.10(B), opening sentence, "where grounded" is being removed, as the requirement applies to both grounded and ungrounded installations. The remainder of the section is accurate and contains requirements of parts V, VI and VII as needed. The title relates to grounding in general and should not include "terminal bar' specifically.

Response Message:

Public Input No. 1732-NFPA 70-2017 [Section No. 450.10]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7768-NFPA 70-2018 [Section No. 450.14]

450.14 Disconnecting Means.

Transformers, other than Class 2 or Class 3 transformers, shall have a disconnecting means located either in sight of the transformer or in a remote location. Where located in a remote location, the disconnecting means shall be lockable open in accordance with 110.25, and its location shall be field marked on the transformer.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 08:47:27 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The word "open" has been added to align with the requirements in 110.25. The suggested limitation of 1000 volts or less has been resolved as it creates an unsafe work condition with no ability to de-energize an installation for maintenance.

Response Message:

Public Input No. 501-NFPA 70-2017 [Section No. 450.14]

Public Input No. 1577-NFPA 70-2017 [Section No. 450.14]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7782-NFPA 70-2018 [Section No. 450.21(B)]

(B) Over 112½ kVA.

Individual dry-type transformers of more than 112½ kVA rating shall be installed in a transformer room of fire-resistant construction. Unless specified otherwise in this article, the term *fire resistant* means a construction having a minimum fire rating of 1 hour.

Exception No. 1: Transformers with Class 155 or higher insulation systems and separated from combustible material by a fire-resistant, heat-insulating barrier or by not less than 1.83 m (6 ft) horizontally and 3.7 m (12 ft) vertically.

Exception No. 2: Transformers with Class 155 or higher insulation systems and completely enclosed except for ventilating openings.

Informational Note: See ~~ANSI/~~ ASTM E119-~~15~~ 16a , ~~Method~~ *Standard Test Methods for Fire Tests of Building Construction and Materials*.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 09:50:08 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: Updates to the ASTM Standard revision date and title have been made to meet current versions.

Response Message:

Public Input No. 834-NFPA 70-2017 [Section No. 450.21(B)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7788-NFPA 70-2018 [Section No. 450.23(A)]

(A) Indoor Installations.

Indoor installations shall be permitted in accordance with one of the following:

(1) In Type I or Type II buildings, in areas where all of the following requirements are met:

(2) The transformer is rated 35,000 volts or less.

(3) No combustible materials are stored.

(4) A liquid confinement area is provided.

(5) The installation complies with all the restrictions provided for in the listing of the liquid.

Informational Note: Such restrictions may include, but are not limited to: maximum pressure of the tank, use of a pressure relief valve, appropriate fuse types and proper sizing of overcurrent protection.

(2) With an automatic fire extinguishing system and a liquid confinement area, provided the transformer is rated 35,000 volts or less

~~In accordance with~~
(3) With 450.26

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Supplemental Information

File Name	Description	Approved
Panel_9_FR-7788_450.23_A_leg_changes.docx	For staff use	✓

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Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 10:19:34 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 is correcting a significant error in the 2017 NEC that mis-formatted this section in a manner that resulted in text that makes it impossible to install these transformers indoors. Specifically, there are supposed to be three options, in numerical order (and therefore identified with cardinal numbers 1, 2, & 3). The first contains four sub-conditions lettered a., b., c. and d.; The second option (#2) on sprinklers and liquid confinement is supposed to follow the new (2017 NEC) informational note, and that option is then to be followed by a third option (#3) to follow the rules for mineral oil.

The 2017 NEC reformatted the second and third options without cardinal numbers, and instead with the additional letters of the alphabet following “a” through “d” in the first option (that is, “e” and “f”). This makes the second and third options additional conditions of the first option. Note also that the parent language refers to “one of the following” which clearly implies more than one option. More importantly, since it is physically impossible to meet all these conditions simultaneously, the option to use

less-flammable liquid insulated transformers indoors no longer exists. This first revision restores the 2014 NEC formatting and thereby the intended allowances and requirements.

Response Message:

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7783-NFPA 70-2018 [Section No. 450.27]

450.27 Oil-Insulated Transformers Installed Outdoors.

Combustible material, combustible buildings, and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires originating in oil-insulated transformers installed on roofs, attached to or adjacent to a building or combustible material.

In cases where the transformer installation presents a fire hazard, one or more of the following safeguards shall be applied according to the degree of hazard involved:

(1) Space separations

(2) Fire-resistant barriers

(3) Automatic fire suppression systems

(4) Enclosures that confine the oil of a ruptured transformer tank

Oil enclosures shall be permitted to consist of fire-resistant dikes, curbed areas or basins, or trenches filled with coarse, crushed stone. Oil enclosures shall be provided with trapped drains where the exposure and the quantity of oil involved are such that removal of oil is important.

Informational Note: For additional information on transformers installed on poles or structures or under ground, see ANSI/IEEE C2-~~2007~~ 2017, *National Electrical Safety Code*.

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 09:53:50 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: NESC reference is updated to 2017. Edit provided to include IEEE reference.
Response Message:

Public Input No. 835-NFPA 70-2017 [Section No. 450.27]

Public Input No. 791-NFPA 70-2017 [Section No. 450.27]

First Revision No. 7784-NFPA 70-2018 [Section No. 450.42]

450.42 Walls, Roofs, and Floors.

The walls and roofs of vaults shall be constructed of materials that have approved structural strength for the conditions with a minimum fire resistance of 3 hours. The floors of vaults in contact with the earth shall be of concrete that is not less than 100 mm (4 in.) thick, but, where the vault is constructed with a vacant space or other stories below it, the floor shall have approved structural strength for the load imposed thereon and a minimum fire resistance of 3 hours. For the purposes of this section, studs and wallboard construction shall not be permitted.

Exception: Where transformers are protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.

Informational Note No. 1: For additional information, see ~~ANSI/~~ ASTM E119-~~15~~ 16a , ~~*Method*~~ *Methods for Fire Tests of Building Construction and Materials*.

Informational Note No. 2: A typical 3-hour construction is 150 mm (6 in.) thick reinforced concrete.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 10:01:59 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: Updates to the ASTM Standard revision date and title have been made to reflect current versions.
Response Message:

Public Input No. 836-NFPA 70-2017 [Section No. 450.42]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7785-NFPA 70-2018 [Section No. 450.43(C)]

(C) Locks.

Doors shall be equipped with locks, and doors shall be kept locked, access being allowed only to qualified persons. Personnel doors shall open in the direction of egress and be equipped with listed ~~panic~~ fire exit hardware.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: NEC Section 450.3(A) requires a door with a minimum fire rating of 3 hours. Fire exit hardware is a more appropriate requirement, it is panic hardware that has additionally been evaluated for use on fire rated door assemblies. As currently written the installation of fire exit hardware may be considered a violation and even worse, if panic hardware were to be installed it may fail to operate as intended during a fire incident as it has not been subjected to the additional testing associated with fire exit hardware.

Panic hardware is only tested and listed in accordance with UL 305 "Panic Hardware," whereas fire exit hardware is tested and listed in accordance with 3 standards: UL 305 "Panic Hardware"; UL 10B "Fire Tests of Door Assemblies"; and UL 10C "Positive Pressure Fire Tests of Door Assemblies".

Response Message:

Public Input No. 695-NFPA 70-2017 [Section No. 450.43(C)]

FOR CODE MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7787-NFPA 70-2018 [Section No. 450.45(E)]

(E) Dampers.

All ventilation openings to the indoors shall be provided with automatic closing fire dampers that operate in response to a vault fire. Such dampers shall possess a standard fire rating of not less than 1½ hours.

Informational Note: See ANSI/UL 555-~~2011~~ 2016 , *Standard for Fire Dampers*.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Street Address:
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Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: Update to the ANSI/UL Standard revision date has been made to reflect current versions.

ANSI was retained in the title of the referenced document as it is a consensus based shared standard.

Response Message:

Public Input No. 837-NFPA 70-2017 [Section No. 450.45(E)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7772-NFPA 70-2018 [Section No. 450.6(A)(1)]

(1) Loads at Transformer Supply Points Only.

Where all loads are connected at the transformer supply points at each end of the tie and overcurrent protection is not provided in accordance with Parts I, II, and VIII of Article 240, the ~~rated~~ ampacity of the tie shall not be less than 67 percent of the rated secondary current of the highest rated transformer supplying the secondary tie system.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Wed Jan 10 09:13:02 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The use of the term "rating" generally applies to equipment whereas the term "ampacity" only applies to conductors. The term "rated" is deleted as it is incorrectly used in this section.

Response Message:

Public Input No. 920-NFPA 70-2017 [Section No. 450.6(A)(1)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7773-NFPA 70-2018 [Section No. 450.6(A)(2)]

(2) Loads Connected Between Transformer Supply Points.

Where load is connected to the tie at any point between transformer supply points and overcurrent protection is not provided in accordance with Parts I, II, and VIII of Article 240, the ~~rated~~ ampacity of the tie shall not be less than 100 percent of the rated secondary current of the highest rated transformer supplying the secondary tie system.

Exception: Tie circuits comprised of multiple conductors per phase shall be permitted to be sized and protected in accordance with 450.6(A)(4).

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
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Submittal Date: Wed Jan 10 09:15:02 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The use of the term "rating" generally applies to equipment whereas the term "ampacity" only applies to conductors. The term "rated" is deleted as it is incorrectly used in this section.

Response Message:

Public Input No. 921-NFPA 70-2017 [Section No. 450.6(A)(2)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7774-NFPA 70-2018 [Section No. 450.9]

450.9 Ventilation.

The ventilation shall dispose of the transformer full-load heat losses without creating a temperature rise that is in excess of the transformer rating.

Informational Note No. 1: See ~~ANSI/~~ IEEE C57.12.00-~~1993~~ 2015 , *General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers*, and ~~ANSI/~~ IEEE C57.12.01-~~1989~~ 2015 , *General Requirements for Dry-Type Distribution and Power Transformers*.

Informational Note No. 2: Additional losses may occur in some transformers where nonsinusoidal currents are present, resulting in increased heat in the transformer above its rating. See ~~ANSI/~~ IEEE C57.110-~~1993~~ 2008 , *Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents*, where transformers are utilized with nonlinear loads.

Transformers with ventilating openings shall be installed so that the ventilating openings are not blocked by walls or other obstructions. The required clearances shall be clearly marked on the transformer. Transformer top surfaces that are horizontal and readily accessible shall be marked to prohibit storage.

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Submitter Full Name: NEC-CMP Panel 09
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City:
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Submittal Date: Wed Jan 10 09:18:00 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: CMP 9 updates references to the IEEE standards.

No change to the title is made as it currently correctly identifies the purpose of the section.

The enclosure type indicates the environment in which a transformer was tested and can be safely installed. This concept is further supported by existing language in 110.3(B). A final sentence to the section is added to assist the installer and inspector in enforcement of keeping that area clear, mirroring test conditions. The wording reflects the NEC status as an installation document.

Response Message:

Public Input No. 634-NFPA 70-2017 [Section No. 450.9]

Public Input No. 833-NFPA 70-2017 [Section No. 450.9]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7795-NFPA 70-2018 [Section No. 490.1]

490.1 Scope.

This article covers the general requirements for equipment operating at more than 1000 volts, nominal.

Informational Note No. 1: See *NFPA 70E*-~~2015~~ 2018 , *Standard for Electrical Safety in the Workplace*, for electrical safety requirements for employee workplaces.

Informational Note No. 2: For further information on hazard signs and labels, see ANSI Z535.4-2011, *Product Signs and Safety Labels*.

Informational Note No. 3: For information regarding power distribution apparatus, see IEEE 3001.5-2013, *Recommended Practice for the Application of Power Distribution Apparatus in Industrial and Commercial Power Systems.*

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Submittal Date: Wed Jan 10 10:52:00 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The addition of IEEE 3001.5 in I.N. No. 3 to the scope of this article provides the user a guide to leading practices in power distribution standards.

The version date of 70E was also updated to 2018 reflecting the latest update.

Response Message:

Public Input No. 3251-NFPA 70-2017 [Section No. 490.1]

FOR CODE MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7827-NFPA 70-2018 [Section No. 490.21(A)]

(A) Circuit Breakers.

(1) Location.

(a) Circuit breakers installed indoors shall be mounted either in metal-enclosed units or fire-resistant cell-mounted units, or they shall be permitted to be open-mounted in locations accessible to qualified persons only.

(b) Circuit breakers used to control oil-filled transformers in a vault shall either be located outside the transformer vault or be capable of operation from outside the vault.

(c) Oil circuit breakers shall be arranged or located so that adjacent readily combustible structures or materials are safeguarded in an approved manner.

(2) Operating Characteristics.

Circuit breakers shall have the following equipment or operating characteristics:

(1) An accessible mechanical or other identified means for manual tripping, independent of control power

(2) Be release free (trip free)

(3) If capable of being opened or closed manually while energized, main contacts that operate independently of the speed of the manual operation

(4) A mechanical position indicator at the circuit breaker to show the open or closed position of the main contacts

(5) A means of indicating the open and closed position of the breaker at the point(s) from which they may be operated

(3) Nameplate.

A circuit breaker shall have a permanent and legible nameplate showing manufacturer's name or trademark, manufacturer's type or identification number, continuous current rating, interrupting rating in megavolt-amperes (MVA) or amperes, and maximum voltage rating. Modification of a circuit breaker affecting its rating(s) shall be accompanied by an appropriate change of nameplate information.

(4) Rating.

Circuit breakers shall have the following ratings:

(1) The continuous current rating of a circuit breaker shall not be less than the maximum continuous current through the circuit breaker.

(2) The interrupting rating of a circuit breaker shall not be less than the maximum fault current the circuit breaker will be required to interrupt, including contributions from all connected sources of energy.

(3) The closing rating of a circuit breaker shall not be less than the maximum asymmetrical fault current into which the circuit breaker can be closed.

(4) The momentary rating of a circuit breaker shall not be less than the maximum asymmetrical fault current at the point of installation.

(5) The rated maximum voltage of a circuit breaker shall not be less than the maximum circuit voltage.

(5) Retrofit Trip Units.

Retrofit trip units shall be listed for use with the specific circuit breaker with which it is installed.

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SUBJECT TO REVISION - NOT FOR PUBLICATION

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09

Make Editorial Changes Based on Committee Text

Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 13:32:48 EST 2018

Committee Statement and Meeting Notes

Committee Statement: CMP 9 has become aware of the development of retrofit direct-acting trip units for some medium voltage power circuit breaker applications and is acting to require a listing to make sure they are applied safely.

Response Message:

Public Input No. 3130-NFPA 70-2017 [New Section after 490.47]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7805-NFPA 70-2018 [Section No. 490.21(E) [Excluding any Sub-Sections]]

Load-interrupter switches shall be permitted if suitable fuses or circuit breakers are used in conjunction with these devices to interrupt fault currents. Where these devices are used in combination, they shall be coordinated electrically so that they will safely withstand the effects of closing, carrying, or interrupting all possible currents up to the assigned maximum short-circuit rating.

Where more than one switch is installed with interconnected load terminals to provide for alternate connection to different supply conductors, each switch shall be provided with a ~~conspicuous~~ warning sign identifying ~~this hazard.~~ the presence of more than one source. Each warning sign or label shall comply with 110.21.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
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Street Address:
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Submittal Date: Wed Jan 10 11:17:10 EST 2018

Make Editorial Changes Based on Committee Text

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Committee Statement and Meeting Notes

Committee Statement: Current text requires a conspicuous sign identifying the hazard, but does not state what hazard is to be identified. New text has been added to identify the hazard of "more than one source", and to comply with the signage requirements of 110.21 for consistency.

No change was made to eliminate the term "maximum" for the following reason: Electric distribution systems operating above 1,000 Volts can be very dynamic. Without notice, automatic line sectionalizing can transfer a service from the tail end of one circuit to the head end of an adjacent circuit, with a significant increase in available fault current. NFPA 70E needs to differentiate between minimum available, maximum available, and available (normal operating condition) fault currents to evaluate arc flash, impact of harmonics, setting overcurrent relays, and fault interrupting and withstand ratings of electrical equipment. The term “available” does not intrinsically imply maximum, and is commonly understood to reflect the present operating condition. Retaining the term “maximum” clarifies the value needed to satisfy this section relative to an equipment rating.

Response Message:

Public Input No. 1265-NFPA 70-2017 [Section No. 490.21(E) [Excluding any Sub-Sections]]

Public Input No. 1884-NFPA 70-2017 [Section No. 490.21(E) [Excluding any Sub-Sections]]

First Revision No. 7811-NFPA 70-2018 [Section No. 490.35(B)]

(B) Control Equipment.

Where operating at 1000 volts, nominal, or less, control equipment, relays, motors, and the like shall not be installed in compartments with ~~exposed~~ high-voltage ~~energized~~ parts or high-voltage wiring, unless ~~either of the following conditions is met~~ :

(1) The access means is interlocked with the high-voltage switch or disconnecting means to prevent the access means from being opened or removed

~~.~~

(2) ~~The high-voltage switch or~~ when the high-voltage switch is in the closed position or a withdrawable disconnecting means is in the connected position, and

(3) All high-voltage parts or high-voltage wiring in the compartment that remain energized when a fixed mounted high-voltage switch is in the open position or a withdrawable disconnecting means is in the isolating (fully withdrawn) position are protected by insulating or grounded metal barriers to prevent accidental contact with energized high-voltage parts or wiring .

Supplemental Information

File Name	Description	Approved
Panel_9_FR-7811_490.35_B_leg_changes.docx	For staff use	✓

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jan 10 11:25:28 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: It is understood that the purpose of this section is to require that when any compartment containing low voltage equipment is opened, there shall be no high voltage parts or wiring exposed to contact in the opened compartment.

Section 490.35(B) of the 2017 NEC offers two conditions that will allow low voltage components to be installed in compartments having exposed high voltage energized parts or high-voltage wiring, but these two conditions are interrelated, and should actually be stated as one. Condition (1) requires interlocking to prevent an access means from being opened or removed at any time; i.e, there is no allowance to open the access means even if the high voltage switch or disconnect is in the isolating position. Condition (2) requires that when the switch/disconnecting means is in the non-isolated position, that there can be no low voltage parts in the compartment, which would require that the parts move from the compartment when the switch is moved to the isolated position.

The revised wording clarifies the requirement and provides the expected level of safety that was originally intended.

Response Message:

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Public Input No. 2171-NFPA 70-2017 [Section No. 490.35(B)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7823-NFPA 70-2018 [Section No. 490.44(C)]

(C) Switching Mechanism.

The switching mechanism shall be arranged to be operated from a location outside the enclosure where the operator is not exposed to energized parts and shall be arranged to open all ungrounded conductors of the circuit simultaneously with one operation. Switches shall be lockable open in accordance with 110.25.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
City:
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Submittal Date: Wed Jan 10 13:22:43 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The word "open" has been added to align with the requirements in 110.25.
Response Message:

Public Input No. 1578-NFPA 70-2017 [Section No. 490.44(C)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7824-NFPA 70-2018 [Section No. 490.46]

490.46 Circuit Breaker Locking.

Circuit breakers shall be capable of being locked in the open position or, if they are installed in a drawout mechanism, that mechanism shall be capable of being locked in such a position that the mechanism cannot be moved into the connected position. In either case, the provision for locking shall be lockable open in accordance with 110.25.

Submitter Information Verification

Submitter Full Name: NEC-CMP Panel 09
Organization: [Not Specified]
Street Address:
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Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The word "open" has been added to align with the requirements in 110.25.
Response Message:

Public Input No. 1579-NFPA 70-2017 [Section No. 490.46]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

First Revision No. 7836-NFPA 70-2018 [Section No. 490.48(B)]

(B) Diagram.

A permanent, single-line diagram of the switchgear shall be provided in a readily visible location within the same room or enclosed area with the switchgear, and this diagram shall clearly identify interlocks, isolation means, and all possible sources of voltage to the installation under normal or emergency conditions and the marking on the switchgear shall cross-reference the diagram.

Exception: Where the equipment consists solely of a single cubicle or metal-enclosed ~~unit~~ substation containing only one ~~set of~~ high-voltage switching ~~devices~~ device , diagrams shall not be required.

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City:
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Submittal Date: Wed Jan 10 14:07:59 EST 2018

Make Editorial Changes Based on Committee Text

Committee Statement and Meeting Notes

Committee Statement: The term "unit" has been removed to correlate with the definition of ”substation” in Article 100. "set of" has also been removed to provide further clarity to assure that there is only one high-voltage switching device in the system, therefore not requiring a single-line diagram.

Response Message:

Public Input No. 3239-NFPA 70-2017 [Section No. 490.48(B)]

FOR CODE-MAKING PANEL USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION