



National Fire Protection Association

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WORKING DRAFT OF NEC CODE-MAKING **PANEL 11 MEETING OUTPUT**

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

Document: National Electrical Code®

Revision Cycle: A2025

Meeting Dates: January 18 - 20, 2024

Panel Activity: Input Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Code-Making Panel 11 First Draft Meeting. It includes draft copies of the First Revisions and any Global Revisions.

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

**First Revision No. 8066-NFPA 70-2024 [Global Input]**

[See attached Word file for revisions throughout Article 430]

430.1 Scope.

This article covers motors, motor branch-circuit and feeder conductors and their protection, motor overload protection, motor control circuits, motor controllers, and motor control centers.

Figure Informational Note Figure 430.1 Article 430 Contents.

Informational Note No. 1: See Informational Note Figure 430.1 for the arrangement of this article.

Informational Note No. 2: See 110.26(E) for installation requirements for motor control centers.

Informational Note No. 3: See 440.1 for air-conditioning and refrigerating equipment.

Informational Note No. 4: See Part X for additional requirements for motors utilizing adjustable-speed drive systems.

Informational Note No. 5: See Part XI for additional requirements for motors that operate over 1000 volts ac, 1500 volts dc, nominal.

430.21 General.

Part II specifies ampacities of conductors that are capable of carrying the motor current without overheating under the conditions specified.

Part II shall not apply to motor circuits rated over 1000 volts ac, 1500 volts dc, nominal.

Informational Note No. 1: See Part XI for motor circuits rated over 1000 volts ac, 1500 volts dc, nominal.

Informational Note No. 2: See 110.14(C) and 430.9(B) for equipment device terminal requirements.

430.31 General.

Part III specifies overload devices intended to protect motors, motor-control apparatus, and motor branch-circuit conductors against excessive heating due to motor overloads and failure to start.

Informational Note No. 1: See Informative Annex D, Example D8.

Informational Note No. 2: See Article 100 for the definition of *Overload*.

(A) Where Hazard Exists.

These provisions shall not require overload protection where a power loss would cause a hazard, such as in the case of fire pumps.

Informational Note: See 695.7 for protection of fire pump supply conductors.

(B) Not Over 1000 Volts ac, 1500 Volts dc, Nominal.

Part III shall not apply to motor circuits rated over 1000 volts ac , 1500 volts dc , nominal.

Informational Note: See Part XI for over 1000 volts ac , 1500 volts dc , nominal.

430.51 General.

Part IV specifies devices intended to protect the motor branch-circuit conductors, the motor control apparatus, and the motors against overcurrent due to short circuits or ground faults. The devices specified in Part IV do not include the types of devices required by 210.8, 230.95, and 590.6.

Informational Note No. 1: See Informative Annex D, Example D8, for an example of motor branch-circuit short-circuit and ground-fault protection selection.

Part IV shall not apply to motor circuits rated over 1000 volts ac , 1500 volts dc , nominal.

Informational Note No. 2: See Part XI for over 1000 volts ac , 1500 volts dc , nominal.

430.53 Several Motors or Loads on One Branch Circuit.

Two or more motors or one or more motors and other loads shall be permitted to be connected to the same branch circuit under conditions specified in 430.53(D) and in 430.53(A), (B), or (C). The branch-circuit protective device shall be fuses or inverse time circuit breakers.

(A) Not Over 1 Horsepower.

Several motors, each not exceeding 1 hp in rating, shall be permitted on a nominal 120-volt branch circuit protected at not over 20 amperes or a branch circuit of 1000 volts ac , 1500 volts dc , nominal, or less, protected at not over 15 amperes, if all of the following conditions are met:

430.102 Location.

(A) Motor Controller.

An individual disconnecting means shall be provided for each motor controller and shall disconnect the motor controller. The disconnecting means shall be located in sight from the motor controller location.

Exception No. 1: For motor circuits over 1000 volts ac , 1500 volts dc , nominal, a motor controller disconnecting means lockable in accordance with 110.25 shall be permitted to be out of sight of the motor controller if the motor controller is marked with a label giving the location of the disconnecting means.

Exception No. 2: A single disconnecting means shall be permitted for a group of coordinated motor controllers that drive several parts of a single machine or piece of apparatus. The disconnecting means shall be located in sight from the motor controllers, and both the disconnecting means and the motor controllers shall be located in sight from the machine or apparatus.

Exception No. 3: The disconnecting means shall not be required to be in sight from valve actuator motor (VAM) assemblies containing the motor controller where such a location introduces additional or increased hazards to persons or property and the following conditions are met:

430.110 Current Rating and Interrupting Capacity.

(A) General.

The disconnecting means for motor circuits rated 1000 volts ac , 1500 volts dc, nominal, or less shall have a current rating not less than 115 percent of the full-load current rating of the motor.

Exception: A listed unfused motor-circuit switch having a horsepower rating not less than the motor horsepower shall be permitted to have a current rating less than 115 percent of the full-load current rating of the motor.

430.120 General.

The installation requirements for Part I through Part IX are applicable unless modified or supplemented by Part X.

Power conversion equipment used in adjustable-speed drive systems shall comply with Part X for an input or output rated 1000 volts ac , 1500 volts dc, nominal or lower and with Part XI for an input or output rated over 1000 volts ac , 1500 volts dc, nominal .

Part XI. Over 1000 Volts ac , 1500 Volts dc, Nominal

430.205 Size of Conductors.

The ampacities of conductors supplying equipment rated over 1000 volts ac , 1500 volts dc , nominal, shall be determined in accordance with 315.60 or 430.205(A) and (B).

430.206 Motor-Circuit Overcurrent Protection.

(A) General.

Each motor circuit shall include coordinated protection to automatically interrupt overload and fault currents in the motor, the motor-circuit conductors, and the motor control apparatus. Adjustable-speed drive systems with input or output voltages over 1000 volts ac , 1500 volts dc, nominal, shall comply with 430.124 and 430.126. All other motors shall comply with 430.206(B) through (C).

Exception: Where a motor is critical to an operation and the motor should operate to failure if necessary to prevent a greater hazard to persons, the sensing device(s) shall be permitted to be connected to a supervised annunciator or alarm instead of interrupting the motor circuit.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_GlobalFR-8066_Article430.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 10:32:04 EST 2024

Committee Statement

Committee Statement:	All references to 1000 volts are being changed in Article 430 for consistency with other parts of the Code. This change correlates with the correlating committee DC task force PI-4287.
Response Message:	FR-8066-NFPA 70-2024

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First Revision No. 8015-NFPA 70-2024 [Detail]

[430.6(A)(1)]

(1) Table Values.

Other than for motors built for low speeds (less than 1200 RPM), **or** high torques, **canned pumps, or** **and for** multispeed motors, the values given in Table 430.247, Table 430.248, Table 430.249, and Table 430.250 shall be used instead of the actual current rating marked on the motor nameplate to determine the following:

Supplemental Information

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NEC_CMP11_FR-8015_430.6_A_1_.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 16:39:33 EST 2024

Committee Statement

Committee Statement: Changes were made for consistency with 430.6(A)(2)(2). The concern is that canned pumps often have nameplate values that are far higher than the table values.

Response Message: FR-8015-NFPA 70-2024



First Revision No. 8050-NFPA 70-2024 [Detail]

440.14 Location.

Disconnecting means shall be located within sight from, and readily accessible from, the air-conditioning or refrigerating equipment. The disconnecting means shall be permitted to be installed on or within the air-conditioning or refrigerating equipment. Disconnecting means shall meet the working space requirements of 110.26(A).

The disconnecting means shall not be located on panels that are designed to allow access to the air-conditioning or refrigeration equipment or where it obscures the equipment nameplate(s).

Exception No. 1: Where the disconnecting means provided in accordance with 430.102(A) is lockable in accordance with 110.25 and the refrigerating or air-conditioning equipment is essential to an industrial process in a facility with written safety procedures, and where the conditions of maintenance and supervision ensure that only qualified persons service the equipment, a disconnecting means within sight from the equipment shall not be required.

Exception No. 2: Where an attachment plug and receptacle serve as the disconnecting means in accordance with 440.13, their location shall be accessible but shall not be required to be readily accessible.

Informational Note: See [Article 430](#), Parts VII and IX ~~of Article 430~~ for additional requirements.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 09:13:51 EST 2024

Committee Statement

Committee Statement: The reference to Article 430, Parts VII and IX is updated to comply with 4.1.4 of the NEC Style Manual.

Response Message: FR-8050-NFPA 70-2024

[Public Input No. 2708-NFPA 70-2023 \[Section No. 440.14\]](#)



First Revision No. 8116-NFPA 70-2024 [Detail]

409.110 Marking.

An industrial control panel shall have permanent markings that are visible after installation. The markings in 409.110(2) ~~and (3)~~ shall be attached to the outside of the enclosure. The markings in 409.110(1), ~~(3)~~, (4), (5), ~~and (6)~~, ~~and (7)~~ shall be attached to either the inside or outside of the enclosure. The following markings shall be included:

- (1) Manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product can be identified.
- (2) Supply voltage, number of phases, frequency, and full-load current for each incoming supply circuit.

~~(3) Where the industrial control panel is supplied by more than one electrical source and where more than one disconnecting means is required to disconnect all circuits 50 volts or more within the control panel, marked to indicate that more than one disconnecting means is required to de-energize the equipment. The location of the means necessary to disconnect all circuits 50 volts or more shall be documented and available.~~

- ~~(4)~~ 3) Short-circuit current rating of the industrial control panel based on one of the following:

- a. Short-circuit current rating of a listed and labeled assembly
- b. Short-circuit current rating established utilizing an approved method

Informational Note: See ANSI/UL 508A, *Standard for Industrial Control Panels*, Supplement SB, for an example of an approved method.

Exception to ~~(4)~~ 3: Short-circuit current rating markings are not required for industrial control panels containing only control circuit components.

- ~~(5)~~ 4) If the industrial control panel is intended as service equipment, marked to identify it as being suitable for use as service equipment.

- ~~(6)~~ 5) Electrical wiring diagram, the identification number of a separate electrical wiring diagram, or a designation referenced in a separate wiring diagram.

- ~~(7)~~ 6) An enclosure type number.

Supplemental Information

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Submitter Information Verification

Committee: NEC-P11**Submittal Date:** Fri Jan 19 14:02:19 EST 2024**Committee Statement**

Committee Statement: There is a need for marking or documentation for the location of disconnects, the current language in other areas of the code is not sufficient as industrial control panels can have multiple sources of supply. The requirements of this section are being incorporated into the new 409.23.

Response Message: FR-8116-NFPA 70-2024

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**First Revision No. 8154-NFPA 70-2024 [Detail]**

[Add the following product safety standards to Annex A, Table A.1(b)]

Article	Standard Number	Standard Title
409	UL 1436	Outlet Circuit Testers and Other Similar Indicating Devices
	UL 61010-1	Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements
	UL 61010-2-030	Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2-30: Particular Requirements for Testing and Measuring Circuits

Supplemental Information

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Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 15:38:52 EST 2024

Committee Statement

Committee Statement: Absence of voltage testers and detection devices do not have an associated listing requirement in this Code. Therefore, it is outside the scope of Table A.1(a).

While these aren't currently required to be Listed, the guidance for relevant products safety standards is useful in case installers, AHJ's, other authorities or relevant parties aren't aware of the appropriate standards and are within the scope of Table A.1(b).

Response Message: FR-8154-NFPA 70-2024

Public Input No. 2410-NFPA 70-2023 [Definition:]

**First Revision No. 8070-NFPA 70-2024 [Section No. 409.1]****409.1** Scope.

This article covers industrial control panels intended for general use and operating at ~~1000 volts or less~~ not over 1000 volts ac, 1500 volts dc, nominal .

Informational Note: See ANSI/UL 508A, *Standard for Industrial Control Panels*, a safety standard for industrial control panels.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 10:48:33 EST 2024

Committee Statement

Committee Statement: Reference to 1000 volts is changed for consistency with other parts of the Code. This change correlates with the correlating committee DC task force work.

Response Message: FR-8070-NFPA 70-2024

Public Input No. 2429-NFPA 70-2023 [Section No. 409.1]

**First Revision No. 8073-NFPA 70-2024 [Section No. 409.3]****409.3 – Other Articles.**

In addition to the requirements of this article, industrial control panels that contain branch circuits for specific loads or components, or are for control of specific types of equipment addressed in other articles of this *Code*, shall be constructed and installed in accordance with the applicable requirements from those articles.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Fri Jan 19 10:50:36 EST 2024**Committee Statement****Committee Statement:** This section is redundant and not in compliance with Section 4.1.1 of the NEC Style Manual.**Response Message:** FR-8073-NFPA 70-2024Public Input No. 3722-NFPA 70-2023 [Section No. 409.3]

**First Revision No. 8074-NFPA 70-2024 [Section No. 409.21(A)]****(A) General.**

Industrial control panels shall be provided with overcurrent protection in accordance with Article 240, Parts I and II of Article 240.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 10:52:14 EST 2024

Committee Statement

Committee Statement: Revised to comply with Section 4.1.4 of the NEC Style Manual.

Response Message: FR-8074-NFPA 70-2024

Public Input No. 2682-NFPA 70-2023 [Section No. 409.21(A)]

**First Revision No. 8111-NFPA 70-2024 [New Section after 409.22]****409.23 Source(s) of Supply.****(A) Identification.**

Industrial control panels shall identify the location of the means necessary to disconnect all sources of supply 50-volts or more marked in accordance with 409.24(C) or documented in a manner that is available to those authorized to install, inspect, and maintain the equipment.

(B) Multiple Sources of Supply.

Industrial control panels supplied by more than one source operating at 50-volts or more, and where more than one disconnecting means is required to disconnect all circuits operating at 50-volts or more, shall be permanently marked with the following:

WARNING – MULTIPLE DISCONNECTING MEANS REQUIRED TO DE-ENERGIZE ALL SOURCES OF SUPPLY 50-VOLTS OR MORE

(C) Markings.

Markings installed to comply with the requirements of 409.24(A) or (B) shall be a label that complies with both of the following:

(1) Be permanently affixed to the exterior of the enclosure and of sufficient durability to withstand the environment involved

(2) Use a method that is not handwritten

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 13:49:32 EST 2024

Committee Statement

Committee Statement: There is a need for marking or documentation for the location of disconnects, the current language in other areas of the code is not sufficient as industrial control panels can have multiple sources of supply. There is a related FR deleting the existing requirements in 409.110(3) as they are incorporated into this new section.

Response Message: FR-8111-NFPA 70-2024

Public Input No. 1759-NFPA 70-2023 [New Section after 409.22]

Public Input No. 1518-NFPA 70-2023 [New Section after 409.30]

**First Revision No. 8093-NFPA 70-2024 [Section No. 409.30]****409.30** Disconnecting Means.

Disconnecting means that supply motor loads shall comply with Part IX of Article 430 , Part IX .

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 11:48:07 EST 2024

Committee Statement

Committee Statement: The reference to Part IX of Article 430 in 409.30 is revised to comply with section 4.1.4 of the NEC Style Manual.

Response Message: FR-8093-NFPA 70-2024

Public Input No. 2683-NFPA 70-2023 [Section No. 409.30]

**First Revision No. 8126-NFPA 70-2024 [Section No. 409.110]****409.110** Marking.

An industrial control panel shall have permanent markings that are visible after installation. The markings in 409.110(2) ~~and (3), and (4)~~ shall be attached to the outside of the enclosure. The markings in 409.110(1), (4) ~~(5)~~, (6), and (7) shall be attached to either the inside or outside of the enclosure. The following markings shall be included:

- (1) Manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product can be identified.
- (2) Supply voltage, number of phases, frequency, and full-load current for each incoming supply circuit.
- (3) Where the industrial control panel is supplied by more than one electrical source and where more than one disconnecting means is required to disconnect all circuits 50-volts or more within the control panel, marked to indicate that more than one disconnecting means is required to de-energize the equipment. The location of the means necessary to disconnect all circuits 50-volts or more shall be documented and available.
- (4) Short-circuit current rating of the industrial control panel based on one of the following:
 - (5) Short-circuit current rating of a listed and labeled assembly
 - (6) Short-circuit current rating established utilizing an approved method

Informational Note: See ANSI/UL 508A, *Standard for Industrial Control Panels*, Supplement SB, for an example of an approved method.

Exception to (4): Short-circuit current rating markings are not required for industrial control panels containing only control circuit components.

- (7) If the industrial control panel is intended as service equipment, marked to identify it as being suitable for use as service equipment.
- (8) Electrical wiring diagram, the identification number of a separate electrical wiring diagram, or a designation referenced in a separate wiring diagram.
- (9) An enclosure type number.

Supplemental Information

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Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 14:24:46 EST 2024

Committee Statement

Committee Statement: The requirement was changed to facilitate proper application of equipment, which may need to be done while the industrial control panel is in operation.

Response FR-8126-NFPA 70-2024
Message:

[Public Input No. 1747-NFPA 70-2023 \[Section No. 409.110\]](#)

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**First Revision No. 7922-NFPA 70-2024 [Section No. 430.1]****430.1 Scope.**

This article covers motors, motor branch-circuit and feeder conductors and their protection, motor overload protection, motor control circuits, motor controllers, and motor control centers.

Figure Informational Note Figure 430.1 Article 430 Contents.

General, 430.1 through 430.18	Part I
Motor Circuit Conductors, 430.21 through 430.29	Part II
Motor and Branch-Circuit Overload Protection, 430.31 through 430.44	Part III
Motor Branch-Circuit Short-Circuit and Ground-Fault Protection, 430.51 through 430.58	Part IV
Motor Feeder Short-Circuit and Ground-Fault Protection, 430.61 through 430.63	Part V
Motor Control Circuits, 430.71 through 430.75	Part VI
Motor Controllers, 430.81 through 430.90	Part VII
Motor Control Centers, 430.92 through 430.99	Part VIII
Disconnecting Means, 430.101 through 430.113	Part IX
Adjustable-Speed Drive Systems, 430.120 through 430.131	Part X
Over 1000 Volts, Nominal, 430.201 through 430.208	Part XI
Protection of Live Parts — All Voltages, 430.231 through 430.233	Part XII
Grounding — All Voltages, 430.241 through 430.245	Part XIII
Tables, Tables 430.247 through 430.251(B)	Part XIV

To Supply	
Motor feeder overcurrent protection	Part V
Motor feeder conductors	Part II
Motor controller disconnecting means	Part IX
Motor branch-circuit short-circuit and ground-fault protection	Part IV
Motor control circuits	Part VI
Motor controller	Part VII
Motor overload protection	Part III
Motor branch-circuit conductors	Part II
Local motor disconnecting means	Part IX
Motor	Part I
Motor thermal protection	Part III
Grounding	Part XIII
Secondary controller	Part II
Secondary conductors	Part II
Secondary resistor	Article 470

Informational Note No. 1: See Informational Note Figure 430.1 for the arrangement of this article.

Informational Note No. 2: See 110.26(E) for installation requirements for motor control centers.

Informational Note No. 3: See 440.1 for air-conditioning and refrigerating equipment.

Informational Note No. 4: See Part X for additional requirements for motors utilizing adjustable-speed drive systems.

Informational Note No. 5: See Part XI for additional requirements for motors that operate over 1000 volts, nominal.

Informational Note No. 6: See IEEE Std 3004.8-2016, IEEE Recommended Practice for Motor Protection for Industrial and Commercial Power Systems, for additional information on ac and dc motor overload protection as well as motor branch-circuit short-circuit and ground-fault protection for fixed speed and adjustable speed drive applications for all voltages.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 09:38:04 EST 2024

Committee Statement

Committee Statement: Recommends acceptance of this informational note to the scope of article 430 while recognizing that the correlating committee has responsibility for scopes. Information provided in IEEE 3004.8 would provide additional data for motor & motor control application installations.

Response Message: FR-7922-NFPA 70-2024

Public Input No. 1809-NFPA 70-2023 [New Part after I.]

Public Input No. 4375-NFPA 70-2023 [Section No. 430.1]

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**First Revision No. 7925-NFPA 70-2024 [Section No. 430.2]**

[Move from 430.2-2 to 430.3]

430.3 Reconditioned Motors.

Reconditioned motors shall be permitted to be installed if the reconditioning has been conducted in accordance with the manufacturer's instructions or, if no instructions are provided, nationally recognized standards.

Reconditioned motors ~~identified~~ for use in hazardous (classified) locations shall be ~~listed as reconditioned if installed in hazardous (classified) locations~~ permitted where permitted elsewhere in this Code.

Informational Note: See ANSI/EASA AR100-2020, *Recommended Practice for the Repair of Rotating Electrical Apparatus*, for information on the rewinding and repair of motors.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 09:45:30 EST 2024

Committee Statement

Committee Statement: Relocated for compliance with the NEC Style Manual Section 2.2.1. The change for hazardous duty motors improves clarity and correlates with the hazardous duty articles.

Response Message: FR-7925-NFPA 70-2024

Public Input No. 1979-NFPA 70-2023 [Section No. 430.2]

Public Input No. 2610-NFPA 70-2023 [Section No. 430.2]

Public Input No. 3746-NFPA 70-2023 [Section No. 430.2]

**First Revision No. 7926-NFPA 70-2024 [Section No. 430.5]****430.5** – Other Articles.

Motors and controllers shall also comply with the applicable provisions of Table 430.5 .

Table 430.5 Other Articles

Equipment/Occupancy Article Section Air-conditioning and refrigerating equipment 440 - Capacitors - 460.8, 460.9 Commercial garages; aircraft hangars; motor fuel dispensing facilities; bulk storage plants; spray application, dipping, and coating processes; and inhalation anesthetizing locations 511, 513, 514, 515, 516, and 517 Part IV - Cranes and hoists 610 - Electrically driven or controlled irrigation machines 675 - Elevators, dumbwaiters, escalators, moving walks, wheelchair lifts, and stairway chair lifts 620 - Fire pumps 695 - Hazardous (classified) locations 500–503, 505, and 506 - Industrial machinery 670 - Motion picture projectors - 540.11 and 540.20 Motion picture and television studios and similar locations 530 - Resistors and reactors 470 - Theaters, audience areas of motion picture and television studios, and similar locations - 520.48 Transformers and transformer vaults 450 -

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 09:49:26 EST 2024

Committee Statement

Committee Statement: Section 430.5 deleted per section 4.1.4 of the NEC Style Manual to remove references to an entire article. Removing references to articles would result in a table that would not add to the usability of the Code, so the entire table was deleted.

Response Message: FR-7926-NFPA 70-2024

Public Input No. 997-NFPA 70-2023 [Section No. 430.5]

**First Revision No. 7929-NFPA 70-2024 [Section No. 430.6(A)(1)]****(1) Table Values.**

Other than for motors built for low speeds (less than 1200 RPM) or high torques, and for multispeed motors, the values given in Table 430.247, Table 430.248, Table 430.249, and Table 430.250 shall be used instead of the actual current rating marked on the motor nameplate to determine the following:

- (1) Ampacity of conductors
- (2) Current ratings of switches
- (3) Current ratings of branch-circuit short-circuit and ground-fault protection

Where a motor is marked in amperes, but not horsepower, the horsepower rating shall be assumed to be that corresponding to the value given in Table 430.247, Table 430.248, Table 430.249, and Table 430.250, interpolated if necessary.

Exception No. 1: Multispeed motors shall be in accordance with 430.22(B) and 430.52.

Exception No. 2: For equipment that employs a shaded-pole or permanent-split capacitor-type fan or blower motor that is marked with the motor type and the marking on the equipment nameplate is not less than the current marked on the fan or blower motor nameplate, the full-load current marked on the nameplate of the appliance shall be used to determine the ampacity of branch-circuit conductors in addition to the current ratings of the following:

- (1) Disconnecting means
- (2) Motor controllers
- (3) Short-circuit and ground-fault protective devices
- (4) Separate overload protective devices

Exception No. 3: For a listed motor-operated appliance that is marked with both motor horsepower and full-load current, the motor full-load current marked on the nameplate of the appliance shall be used instead of the horsepower rating on the appliance nameplate to determine the ampacity of branch-circuit conductors in addition to the current ratings of the following:

- (1) Disconnecting means
- (2) Motor controllers
- (3) Short-circuit and ground-fault protective devices
- (4) Separate overload protective devices

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 10:02:17 EST 2024

Committee Statement

Committee Statement: Correcting a spacing issue between several words.

Response Message: FR-7929-NFPA 70-2024

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NEC CMP-11, January 18-20, 2024, Subject to Revision - Not for Publication

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**First Revision No. 7936-NFPA 70-2024 [Section No. 430.7(A)]****(A) Usual Motor Applications.**

A motor shall be marked with the following information:

- (1) Manufacturer's name.
- (2) Rated volts and full-load current. For a multispeed motor, full-load current for each speed, except shaded-pole and permanent-split capacitor motors where amperes are required only for maximum speed.
- (3) Rated frequency and number of phases if an ac motor.
- (4) Rated full-load speed.
- (5) Rated temperature rise or the insulation system class and rated ambient temperature.
- (6) Time rating. The time rating shall be 5, 15, 30, or 60 minutes, or continuous.
- (7) Rated horsepower if $\frac{1}{8}$ hp or more. For a multispeed motor rated $\frac{1}{8}$ hp or more, rated horsepower for each speed, except shaded-pole and permanent-split capacitor motors rated $\frac{1}{8}$ hp or more where rated horsepower is required only for maximum speed. Motors of arc welders are not required to be marked with the horsepower rating.
- (8) Code letter or locked-rotor amperes if an alternating-current motor rated $\frac{1}{2}$ hp or more. On polyphase wound-rotor motors, the code letter shall be omitted.

Informational Note No. 1: See 430.7(B).

- (9) Design letter for design ~~Design~~ Design A, B, ~~BE~~, C, ~~CE~~, or D motors.

Informational Note No. 2: See ANSI/NEMA MG 1-2016, *Motors and Generators*, Part 1, Definitions, for information on motor design letter definition.

- (10) Secondary volts and full-load current if a wound-rotor induction motor.
- (11) Field current and voltage for dc excited synchronous motors.
- (12) Winding — straight shunt, stabilized shunt, compound, or series, if a dc motor. Fractional horsepower dc motors 175 mm (7 in.) or less in diameter shall not be required to be marked.
- (13) A motor provided with a thermal protector complying with 430.32(A)(2) or (B)(2) shall be marked "thermally protected." Thermally protected motors rated 100 watts or less and complying with 430.32(B)(2) shall be permitted to use the abbreviated marking "T.P."
- (14) A motor complying with 430.32(B)(4) shall be marked "impedance protected." Impedance-protected motors rated 100 watts or less and complying with 430.32(B)(4) shall be permitted to use the abbreviated marking "Z.P."
- (15) Motors equipped with electrically powered condensation prevention heaters shall be marked with the rated heater voltage, number of phases, and the rated power in watts.
- (16) Motors that are electronically protected from overloads in accordance with 430.32(A)(2) and (B)(2) shall be marked "electronically protected" or "E.P."

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 10:30:45 EST 2024

Committee Statement

Committee Statement: This correlates with the addition of two new motor designs in Table 430.251(C). These new designs are to meet increase efficiencies as specified by the DOE and because of differences in motor characteristics such as LRC. A new design is needed to make sure motor protection and control solutions are safely applied.

Response Message: FR-7936-NFPA 70-2024

[Public Input No. 1313-NFPA 70-2023 \[Section No. 430.7\(A\)\]](#)

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

**First Revision No. 7938-NFPA 70-2024 [Section No. 430.10(A)]****(A) General.**

Enclosures for motor controllers and disconnecting means shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to the other apparatus unless designs are employed that provide adequate space for this purpose.

Informational Note: See 312.8 for switch and ~~overcurrent device~~ overcurrent device enclosures.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 10:35:26 EST 2024

Committee Statement

Committee Statement: Editorial change provides correct spelling for overcurrent device as used elsewhere in the code.

Response Message: FR-7938-NFPA 70-2024

Public Input No. 1523-NFPA 70-2023 [Section No. 430.10(A)]

**First Revision No. 7945-NFPA 70-2024 [Section No. 430.32(D)(2)]**

(2) Not Permanently Installed.

- (1) *Within Sight from Controller.* Overload protection shall be permitted to be furnished by the branch-circuit short-circuit and ground-fault protective device; such device, however, shall not be larger than that specified in ~~Part IV of Article 430~~ , Part IV .

Exception: Any such motor shall be permitted on a nominal 120-volt branch circuit protected at not over 20 amperes.

- (2) *Not Within Sight from Controller.* Overload protection shall be in accordance with 430.32(B).

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 11:11:43 EST 2024

Committee Statement

Committee Statement: Editorial change made for section to meet NEC Style manual section 4.1.4.

Response Message: FR-7945-NFPA 70-2024

Public Input No. 2702-NFPA 70-2023 [Section No. 430.32(D)(2)]



First Revision No. 7971-NFPA 70-2024 [Section No. 430.52(C)(1)]

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

(1) In Accordance with Table 430.52(C)(1).

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

A protective device that has a rating or setting not exceeding the value calculated according to the values given in Table 430.52(C)(1) shall be used unless otherwise permitted in 430.52(C)(1)(a) or (C)(1)(b).

Table 430.52(C)(1) Maximum Rating or Setting of Motor Branch-Circuit Short-Circuit and Ground-Fault Protective Devices

<u>Type of Motor</u>	<u>Percentage of Full-Load Current</u>			
	<u>Nontime</u>	<u>Dual</u>	<u>Instantaneous-</u>	<u>Inverse</u>
	<u>Delay</u>	<u>Element</u>		<u>Time</u>
	<u>Fuse¹</u>	<u>(Time-Delay)</u> <u>Fuse¹</u>	<u>Tripp</u> <u>Breaker</u>	<u>Breaker²</u>
Single-phase motors	300	175	800	250
AC polyphase motors other than wound-rotor	300	175	800	250
Squirrel cage — other than Design B or C energy-efficient — and Design B or C premium efficiency	300	175	800	250
Design B energy-efficient and — Design B premium efficiency, Design BE and Design CE	300	175	1100	250
Synchronous ³	300	175	800	250
Wound-rotor	150	150	800	150
DC (constant voltage)	150	150	250	150

Note: See 430.54 for certain exceptions to the values specified.

¹The values in the Nontime Delay Fuse column apply to time-delay Class CC fuses.

²The values given in the last column also cover the ratings of nonadjustable inverse time types of circuit breakers that can be modified as in 430.52(C)(1)(a) and (C)(1)(b).

³Synchronous motors of the low-torque, low-speed type (usually 450 rpm or lower), such as those used to drive reciprocating compressors, pumps, and so forth, that start unloaded, do not require a fuse rating or circuit-breaker setting in excess of 200 percent of full-load current.

(a) Where the values as determined by Table 430.52(C)(1) do not correspond to the standard ampere ratings and settings provided in 240.6, the next higher standard rating or setting shall be permitted.

- (b) Where the rating specified in Table 430.52(C)(1), or the rating modified by 430.52(C)(1)(a), is not sufficient for the starting current of the motor, any of the following shall apply:
- (3) The rating of a nontime-delay fuse not exceeding 600 amperes or a time-delay Class CC fuse shall be permitted to be increased but shall in no case exceed 400 percent of the full-load current.
 - (4) The rating of a time-delay (dual-element) fuse shall be permitted to be increased but shall in no case exceed 225 percent of the full-load current.
 - (5) The rating of an inverse time circuit breaker shall be permitted to be increased but shall in no case exceed 400 percent for full-load currents of 100 amperes or less or 300 percent for full-load currents greater than 100 amperes.
 - (6) The rating of a fuse of 601–6000 ampere classification shall be permitted to be increased but shall in no case exceed 300 percent of the full-load current.

Informational Note: See Informative Annex D, Example D8, for an example of motor branch-circuit short-circuit and ground-fault rating and setting and Informational Note Figure 430.1 for an example location.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-7971_430.52_C_1_.docx	For Staff Use	

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 13:32:48 EST 2024

Committee Statement

Committee Statement: The panel recognizes the need to include BE and CE motors in the code. However, the ratings for instantaneous trip circuit breakers need further technical substantiation providing details on how the protection of the motor circuit components will function properly, including sizing of other components in the motor branch circuit including motor disconnects.

Response Message: FR-7971-NFPA 70-2024

Public Input No. 1471-NFPA 70-2023 [Section No. 430.52(C)(1)]

**First Revision No. 7975-NFPA 70-2024 [Section No. 430.52(C)(3)]****(3) Instantaneous-Trip Circuit Breaker.**

An instantaneous-trip circuit breaker shall be permitted if the conditions of 430.52(C)(3)(a) and (C)(3)(b) are met.

(a) *Application.* Instantaneous-trip circuit breakers shall be adjustable and part of a listed combination motor controller having coordinated motor overload and short-circuit and ground-fault protection in each conductor.

Informational Note No. 1: Instantaneous-trip circuit breakers are also known as motor-circuit protectors (MCPs).

Informational Note No. 2: For the purpose of this article, instantaneous-trip circuit breakers could include a damping means to accommodate a transient motor inrush current without nuisance tripping of the circuit breaker.

(b) *Setting.* The instantaneous-trip circuit breaker shall be adjusted to a setting in accordance with one of the following:

- (3) No greater than the value specified in Table 430.52(C)(1).
- (4) Where the value specified in Table 430.52(C)(1) is not sufficient for the starting current of the motor, one of the following settings shall be permitted:
 - (5) Motors other than design B energy-efficient and Design B premium efficiency motors shall be permitted to be increased but shall in no case exceed 1300 percent of the motor full-load current.
 - (6) Design B or C energy-efficient

and

- (1)
 - a. or Design B or C premium efficiency, Design BE and Design CE motors shall be permitted to be increased but shall in no case exceed 1700 percent of the motor full-load current.
 - b. Where an engineering analysis determines the value is not sufficient for the starting current of the motor, it shall not be necessary to first apply the value specified in Table 430.52(C)(1).

Informational Note No. 3: See NEMA MG 1-2016, *Motors and Generators*, Part 12.59 for additional information on the requirements for a motor to be classified "energy efficient."

- (2) Where the motor full-load current is 8 amperes or less, the setting of the instantaneous-trip circuit breaker with a continuous current rating of 15 amperes or less in a listed combination motor controller that provides coordinated motor branch-circuit overload and short-circuit and ground-fault protection shall be permitted to be increased to the value marked on the motor controller.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-7975_430.52_C_3_.docx		

Submitter Information Verification

Committee: NEC-P11
Submittal Date: Thu Jan 18 13:49:09 EST 2024

Committee Statement

Committee Statement: The panel recognizes the need to include BE and CE motors in the code. However, the ratings for instantaneous trip circuit breakers need further technical substantiation that the 2750% adjustment will provide the protection of the motor circuit components including sizing of controllers, conductors, inst. Trip CB, and motor disconnects.

Response Message: FR-7975-NFPA 70-2024

Public Input No. 1470-NFPA 70-2023 [Section No. 430.52(C)(3)]

[430.52(C)(3)]

(3) Instantaneous-Trip Circuit Breaker.

An instantaneous-trip circuit breaker shall be permitted if the conditions of 430.52(C)(3)(a) and (C)(3)(b) are met.

- (a) *Application.* Instantaneous-trip circuit breakers shall be adjustable and part of a listed combination motor controller having coordinated motor overload and short-circuit and ground-fault protection in each conductor.

Informational Note No. 1: Instantaneous-trip circuit breakers are also known as motor-circuit protectors (MCPs).

Informational Note No. 2: For the purpose of this article, instantaneous-trip circuit breakers could include a damping means to accommodate a transient motor inrush current without nuisance tripping of the circuit breaker.

- (b) *Setting.* The instantaneous-trip circuit breaker shall be adjusted to a setting in accordance with one of the following:

- (1) No greater than the value specified in Table 430.52(C)(1)
- (2) Where the value specified in Table 430.52(C)(1) is not sufficient for the starting current of the motor, one of the following settings shall be permitted:
 - a. Motors other than design B energy-efficient and Design B premium efficiency motors shall be permitted to be increased but shall in no case exceed 1300 percent of the motor full-load current.
 - b. Design B or C energy-efficient ~~and or~~ Design B or C premium efficiency, Design BE, and Design CE motors shall be permitted to be increased but shall in no case exceed 1700 percent of the motor full-load current.
 - c. Where an engineering analysis determines the value is not sufficient for the starting current of the motor, it shall not be necessary to first apply the value specified in Table 430.52(C)(1).

Informational Note No. 3: See NEMA MG 1-2016, *Motors and Generators*, Part 12.59 for additional information on the requirements for a motor to be classified "energy efficient."

- (3) Where the motor full-load current is 8 amperes or less, the setting of the instantaneous-trip circuit breaker with a continuous current rating of 15 amperes or less in a listed combination motor controller that provides coordinated motor branch-circuit overload and short-circuit and ground-fault protection shall be permitted to be increased to the value marked on the motor controller.

**First Revision No. 7976-NFPA 70-2024 [Section No. 430.52(C)(6)]****(6) Self-Protected Combination Motor Controller.**

A listed self-protected combination motor controller shall be permitted in lieu of the devices specified in Table 430.52(C)(1). Adjustable instantaneous-trip settings shall not exceed 1300 percent of the full-load motor current for other than Design B energy-efficient and Design B or C premium efficiency motors and not more than 1700 percent of the full-load motor current for Design B or C energy-efficient and , Design B or C premium efficiency, Design BE, and Design CE motors.

Informational Note: Proper application of self-protected combination motor controllers on 3-phase systems, other than solidly grounded wye, particularly on corner grounded delta systems, considers the self-protected combination motor controllers' individual pole-interrupting capability.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 13:56:33 EST 2024

Committee Statement

Committee Statement: The panel recognizes the need to include BE and CE motors in the code. However, the ratings for instantaneous trip circuit breakers need further technical substantiation that the 2750% adjustment will provide the protection of the motor circuit components including sizing of controllers, conductors, inst. Trip CB, and motor disconnects.

Response Message: FR-7976-NFPA 70-2024

Public Input No. 3564-NFPA 70-2023 [Section No. 430.52(C)(6)]

**First Revision No. 7977-NFPA 70-2024 [Section No. 430.52(C)(7)]****(7) Motor Short-Circuit Protector.**

A motor short-circuit protector shall be permitted in lieu of devices listed in Table 430.52(C)(1) if the motor short-circuit protector is part of a listed combination motor controller having coordinated motor overload protection and short-circuit and ground-fault protection in each conductor and it will open the circuit at currents exceeding 1300 percent of the motor full-load current for other than Design B or C energy-efficient and Design B or C premium efficiency motors and 1700 percent of the motor full-load current for Design B or C energy-efficient and Design B or C premium efficiency, Design BE, and Design CE motors.

Informational Note: A motor short-circuit protector, as used in this section, is a fused device and is not an instantaneous-trip circuit breaker.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 14:00:42 EST 2024

Committee Statement

Committee Statement: The panel recognizes the need to include BE and CE motors in the code. However, the ratings for instantaneous trip circuit breakers need further technical substantiation that the 2750% adjustment will provide the protection of the motor circuit components including sizing of controllers, conductors, inst. Trip CB, and motor disconnects.

Response Message: FR-7977-NFPA 70-2024

Public Input No. 1469-NFPA 70-2023 [Section No. 430.52(C)(7)]

**First Revision No. 7949-NFPA 70-2024 [Section No. 430.53(C)(5)]****(5) Overcurrent Protection.**

Loads other than motor loads shall be protected in accordance with Article 240, Part I through Part VII- ~~of Article 240~~ .

Informational Note: See 110.10 for circuit impedance and other characteristics.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 11:23:11 EST 2024

Committee Statement

Committee Statement: Editorial change for compliance with NEC Style manual section 4.1.4.

Response Message: FR-7949-NFPA 70-2024

Public Input No. 2703-NFPA 70-2023 [Section No. 430.53(C)(5)]

**First Revision No. 7951-NFPA 70-2024 [Section No. 430.72(C)(1)]**

(1) Class 1 Power-Limited, Class 2, or Class 3 Circuits.

Where the transformer supplies a Class 1 power-limited circuit, the circuit shall comply with 724.30 through 724.52. Where the transformer supplies a Class 2 or Class 3 remote-control circuit, the circuit shall comply with the requirements of Part II of Article 725, Part II.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 11:29:02 EST 2024

Committee Statement

Committee Statement: Editorial change for compliance with NEC Style Manual section 4.1.4.

Response Message: FR-7951-NFPA 70-2024

Public Input No. 2704-NFPA 70-2023 [Section No. 430.72(C)(1)]



First Revision No. 8020-NFPA 70-2024 [Section No. 430.83(D)]

(D)– Torque Motors.

For torque motors

– Motors Built for Low Speeds, High Torques, Canned Pumps, and Multi-Speeds.

Where nameplate values are permitted to be used in 430.6(A)(2)(2), the motor controller shall have a continuous-duty, full-load current rating not less than the nameplate current rating of the motor. For a motor controller rated in horsepower but not marked with the foregoing current rating, the equivalent current rating shall be determined from the horsepower rating by using Table 430.247, Table 430.248, Table 430.249, or Table 430.250.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-8020_430.83_D_.docx		

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 16:52:46 EST 2024

Committee Statement

Committee Statement: Considering that nameplate values are used for every other part of the motor circuit in these applications the nameplate rating should also be used for the sizing of the motor controller.

Response Message: FR-8020-NFPA 70-2024

(D) ~~Torque~~ **Motors Built for Low Speeds, High Torques, Canned Pumps, and Multi-Speeds.**

~~Where nameplate values are permitted to be used in 430.6(A)(2)(2). For torque motors,~~ the motor controller shall have a continuous-duty, full-load current rating not less than the nameplate current rating of the motor. For a motor controller rated in horsepower but not marked with the foregoing current rating, the equivalent current rating shall be determined from the horsepower rating by using Table 430.247, Table 430.248, Table 430.249, or Table 430.250.

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

**First Revision No. 7954-NFPA 70-2024 [Section No. 430.94]****430.94** Overcurrent Protection.

Motor control centers shall be provided with overcurrent protection in accordance with Article 240, Parts I, II, and VIII ~~of Article 240~~. The ampere rating or setting of the overcurrent protective device shall not exceed the rating of the common power bus. This protection shall be provided by (1) an overcurrent protective device located ahead of the motor control center or (2) a main overcurrent protective device located within the motor control center.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Thu Jan 18 11:35:58 EST 2024**Committee Statement****Committee Statement:** Editorial change for compliance with NEC Style manual section 4.1.4.**Response Message:** FR-7954-NFPA 70-2024Public Input No. 2705-NFPA 70-2023 [Section No. 430.94]

**First Revision No. 7962-NFPA 70-2024 [Section No. 430.95]****430.95** – Service Equipment.

Where used as service equipment, each motor control center shall be provided with a single main disconnecting means to disconnect all ungrounded service conductors.

Exception No. 1: A second service disconnect shall be permitted to supply additional equipment.

Where a grounded conductor is provided, the motor control center shall be provided with a main bonding jumper, sized in accordance with 250.28(D), within one of the sections for connecting the grounded conductor, on its supply side, to the motor control center equipment ground bus.

Exception No. 2: High-impedance grounded neutral systems shall be permitted to be connected as provided in 250.36.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 13:08:02 EST 2024

Committee Statement

Committee Statement: This section is redundant with other requirements in the code and therefore is not in compliance with NEC Style Manual 4.1.1.

Response Message: FR-7962-NFPA 70-2024

Public Input No. 4028-NFPA 70-2023 [Section No. 430.95]

**First Revision No. 7981-NFPA 70-2024 [Section No. 430.98(A)]****(A) Motor Control Centers.**

Motor control centers shall be marked according to 110.21, and the marking shall be plainly visible after installation. Marking shall also include common power bus current rating and motor control center short-circuit current rating. When supplied by a feeder(s), motor control centers shall be permanently marked in accordance with the following:

(1) With the identification and location(s) of the means necessary to disconnect all power to the motor control center

(2) With a label that is permanently affixed and of sufficient durability to withstand the environment involved

(3) Using a method that is not handwritten

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 14:22:12 EST 2024

Committee Statement

Committee Statement: This will allow for quicker identification of power sources in the event of an emergency.

Response Message: FR-7981-NFPA 70-2024

Public Input No. 1519-NFPA 70-2023 [Section No. 430.98]

Public Input No. 1760-NFPA 70-2023 [Section No. 430.98]

**First Revision No. 8043-NFPA 70-2024 [Section No. 430.99]****430.99 Short-Circuit Current Rating.****(A) Installation.**

Motor control centers shall not be installed where the available fault current exceeds its short-circuit current rating as marked in accordance with 430.98(A).

(B) Available Fault Current.

The available fault current at the motor control center and the date the available fault current calculation was performed shall be documented and made available to those authorized to inspect, install, or maintain the installation.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-8043_430.99.docx		

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 08:43:13 EST 2024

Committee Statement

Committee Statement: This changes the language to more clearly reflect other parts of the code for consistency.

Response Message: FR-8043-NFPA 70-2024

Public Input No. 3308-NFPA 70-2023 [Section No. 430.99]

430.99 ~~Available Fault Current~~ Short-Circuit Rating. [Move to (B)]

~~The available fault current at the motor control center and the date the available fault current calculation was performed shall be documented and made available to those authorized to inspect, install, or maintain the installation.~~

(A) Installation.

Motor control centers shall not be installed where the available fault current exceeds its short-circuit current rating as marked in accordance with 430.98(A).

(B) Available Fault Current.

The available fault current at the motor control center and the date the available fault current calculation was performed shall be documented and made available to those authorized to inspect, install, or maintain the installation.

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**First Revision No. 7988-NFPA 70-2024 [Section No. 430.102(A)]****(A) Motor Controller.**

An individual disconnecting means shall be provided for each motor controller and shall disconnect the motor controller. The disconnecting means shall be located in sight from the motor controller location.

Exception No. 1: For motor circuits over 1000 volts, nominal, a motor controller disconnecting means lockable open in accordance with 110.25 shall be permitted to be out of sight of the motor controller if the motor controller is marked with a label giving the location of the disconnecting means.

Exception No. 2: A single disconnecting means shall be permitted for a group of coordinated motor controllers that drive several parts of a single machine or piece of apparatus. The disconnecting means shall be located in sight from the motor controllers, and both the disconnecting means and the motor controllers shall be located in sight from the machine or apparatus.

Exception No. 3: The disconnecting means shall not be required to be in sight from valve actuator motor (VAM) assemblies containing the motor controller where such a location introduces additional or increased hazards to persons or property and the following conditions are met:

- (1) The valve actuator motor assembly is marked with a label giving the location of the disconnecting means.*
- (2) The disconnecting means is lockable open in accordance with 110.25.*

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 15:09:13 EST 2024

Committee Statement

Committee Statement: Editorial change made to meet NEC Style Manual section 3.2.5.3.

Response Message: FR-7988-NFPA 70-2024

Public Input No. 2535-NFPA 70-2023 [Section No. 430.102]



First Revision No. 7996-NFPA 70-2024 [Section No. 430.110(C)(1)]

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

(1) Horsepower Rating.

The rating of the disconnecting means shall be determined from the sum of all currents, including resistance loads, at the full-load condition and also at the locked-rotor condition. The combined full-load current and the combined locked-rotor current so obtained shall be considered as a single motor for the purpose of this requirement.

The full-load current equivalent to the horsepower rating of each motor shall be selected from Table 430.247, Table 430.248, Table 430.249, or Table 430.250. These full-load currents shall be added to the rating in amperes of other loads to obtain an equivalent full-load current for the combined load.

The locked-rotor current equivalent to the horsepower rating of each motor shall be selected from Table 430.251(A) or Table 430.251(B), or Table 430.251(C). The locked-rotor currents shall be added to the rating in amperes of other loads to obtain an equivalent locked-rotor current for the combined load. Where two or more motors or other loads cannot be started simultaneously, the largest sum of locked-rotor currents of a motor or group of motors that can be started simultaneously and the full-load currents of other concurrent loads shall be permitted to be used to determine the equivalent locked-rotor current for the simultaneous combined loads. In cases where different current ratings are obtained when applying these tables, the largest value obtained shall be used.

Exception No. 1: The locked-rotor current equivalent to the horsepower rating of each polyphase motor with design letter A shall be one of following:

- (1) *If available, the motor's marked value of locked-rotor amperes*
- (2) *In the absence of a marked value of locked-rotor amperes for the motor, the value calculated from Equation 430.110(C)(1)a:*

$$\text{locked-rotor amperes} = \left(\frac{kVA}{hp} \right) \times \frac{(1000 \times \text{motor's marked value of rated horsepower})}{(\text{motor's marked value of rated volts}) \times (\sqrt{3})} \quad [430.110(C)(1)a]$$

where:

kVA = maximum range value of kilovolt-amperes per horsepower with locked rotor in
hp Table 430.7(B) associated with the motor's marked locked-rotor indicating code
 letter

Informational Note: Equation 430.110(C)(1)a is obtained by solving for locked-rotor amperes in the formula for "kilovolt-amperes per horsepower with locked rotor," as follows:

$$\frac{kVA}{hp} = \frac{(\sqrt{3}) \times (\text{motor's marked value of rated volts}) \times (\text{locked-rotor amperes})}{(1000 \times \text{motor's marked value of rated horsepower})} \quad [430.110(C)(1)b]$$

The numerator of Equation 430.110(C)(1)b for kilovolt-amperes per horsepower is the apparent power input to a three-phase motor with locked rotor in units of volt-amperes. The factor of 1000 VA/kVA in the denominator converts this value to units of kilovolt-amperes and "(marked value of rated horsepower)" in the denominator converts this to kilovolt-amperes per horsepower. Note that "motor's marked value of rated volts" is a line-to-line value and "locked-rotor amperes" is a line value as opposed to a phase value.

Exception No. 2: Where part of the concurrent load is resistance load, and where the disconnecting means is a switch rated in horsepower and current, the switch used shall be permitted to have a horsepower rating not less than the combined load of the motor(s) if the current rating of the switch is not less than the locked-rotor current of the motor(s) plus the resistance load.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 15:39:40 EST 2024

Committee Statement

Committee Statement: The addition of the new table 250.251 (C) created the need to include it in this section to maintain readability and clarity.

Response Message: FR-7996-NFPA 70-2024

[Public Input No. 1314-NFPA 70-2023 \[Section No. 430.110\(C\)\(1\)\]](#)

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

**First Revision No. 7998-NFPA 70-2024 [Section No. 430.113]****430.113** Energy from More Than One Source.

Motor and motor-operated equipment receiving electric energy from more than one source shall be provided with disconnecting means from each source of electric energy immediately adjacent to the equipment served. Each source shall be permitted to have a separate disconnecting means. Where multiple disconnecting means are provided, a permanent warning sign shall be provided on or adjacent to each disconnecting means indicating that multiple sources must be shut off to remove all power to the equipment. The sign at each disconnect shall identify the other specific circuits.

Exception No. 1: Where a motor receives electric energy from more than one source, the disconnecting means for the main power supply to the motor shall not be required to be immediately adjacent to the motor if the motor controller disconnecting means is lockable in accordance with 110.25.

Exception No. 2: A separate disconnecting means shall not be required for a Class 2 remote-control circuit complying with Article 725, ~~Parts I and II of Article 725~~, rated not more than 30 volts, and isolated and ungrounded.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 15:43:54 EST 2024

Committee Statement

Committee Statement: Editorial change made for section to meet NEC Style Manual sections 3.2.5.3 and 4.1.4.

Response Message: FR-7998-NFPA 70-2024

Public Input No. 2536-NFPA 70-2023 [Section No. 430.113]

Public Input No. 2706-NFPA 70-2023 [Section No. 430.113]



First Revision No. 7999-NFPA 70-2024 [Section No. 430.122(B)]

(B) Output Conductors.

(1) Output Motor Conductors.

The conductors between the power conversion equipment and the motor shall have an ampacity equal to or larger than 125 percent of the motor full-load current as determined by 430.6(A) or (B).

Exception: If the

(2) Suitable for Output Motor Conductor Protection.

When power conversion equipment is listed and marked as "Suitable for Output Motor Conductor Protection," the ~~conductor~~ conductors between the power conversion equipment and the motor shall have an ampacity equal to or greater than the larger of the following:

- (1) 125 percent of the motor full-load current as determined by 430.6(A) or (B)
- (2) The ampacity of the minimum conductor size marked on the power conversion equipment

Informational Note No. 1: See 430.130 and 430.131 for branch circuit protection requirements. The minimum ampacity required of output conductors is often different than that of the conductors supplying the power conversion equipment.

Informational Note No. 2: Circuit conductors on the output of an adjustable-speed drive system are susceptible to breakdown under certain conditions due to the characteristics of the output waveform of the drive. Factors affecting the conductors include, but are not limited to, the output voltage, frequency, and current; the length of the conductors; the spacing between the conductors; and the dielectric strength of the conductor insulation. Methods to mitigate breakdown include consideration of one or more of these factors.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-7999_430.122_B_.docx		

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 15:49:28 EST 2024

Committee Statement

Committee Statement: Movement of the exception to normative text is to create better clarity.

Response Message: FR-7999-NFPA 70-2024

Public Input No. 845-NFPA 70-2023 [Section No. 430.122(B)]

(B) Output Conductors. [Move text to (1) and (2)]

~~The conductors between the power conversion equipment and the motor shall have an ampacity equal to or larger than 125 percent of the motor full-load current as determined by 430.6(A) or (B).~~

~~Exception: If the power conversion equipment is listed and marked as “Suitable for Output Motor Conductor Protection,” the conductor between the power conversion equipment and the motor shall have an ampacity equal to or greater than the larger of the following:~~

- ~~1. 125 percent of the motor full-load current as determined by 430.6(A) or (B)~~
- ~~2. The ampacity of the minimum conductor size marked on the power conversion equipment~~

~~Informational Note No. 1: See 430.130 and 430.131 for branch circuit protection requirements. The minimum ampacity required of output conductors is often different than that of the conductors supplying the power conversion equipment.~~

~~Informational Note No. 2: Circuit conductors on the output of an adjustable-speed drive system are susceptible to breakdown under certain conditions due to the characteristics of the output waveform of the drive. Factors affecting the conductors include, but are not limited to, the output voltage, frequency, and current; the length of the conductors; the spacing between the conductors; and the dielectric strength of the conductor insulation. Methods to mitigate breakdown include consideration of one or more of these factors.~~

(1) Output Motor Conductors.

The conductors between the power conversion equipment and the motor shall have an ampacity equal to or larger than 125 percent of the motor full-load current as determined by 430.6(A) or (B).

(2) Suitable for Output Motor Conductor Protection.

~~If the~~When power conversion equipment is listed and marked as “Suitable for Output Motor Conductor Protection,” the ~~conductor~~conductors between the power conversion equipment and the motor shall have an ampacity equal to or greater than the larger of the following:

1. 125 percent of the motor full-load current as determined by 430.6(A) or (B)
2. The ampacity of the minimum conductor size marked on the power conversion equipment

Informational Note No. 1: See 430.130 and 430.131 for branch circuit protection requirements. The minimum ampacity required of output conductors is often different than that of the conductors supplying the power conversion equipment.

Informational Note No. 2: Circuit conductors on the output of an adjustable-speed drive system are susceptible to breakdown under certain conditions due to the characteristics of the output waveform of the drive. Factors affecting the conductors include, but are not limited to, the output

voltage, frequency, and current; the length of the conductors; the spacing between the conductors; and the dielectric strength of the conductor insulation. Methods to mitigate breakdown include consideration of one or more of these factors.

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

**First Revision No. 8000-NFPA 70-2024 [Section No. 430.208]****430.208** Disconnecting Means.

The motor controller disconnecting means shall be a switch or circuit breaker having a voltage rating not less than that of the circuit involved, and shall be lockable open in accordance with 110.25. The disconnecting means shall have a current rating of not less than 100 percent of the full-load current rating of the motor. For adjustable-speed drive systems, the disconnecting means shall have a current rating not less than 100 percent of the rated input current of the power conversion equipment.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Thu Jan 18 15:55:40 EST 2024**Committee Statement****Committee Statement:** Editorial change made for section to meet NEC Style manual section 3.2.5.3.**Response Message:** FR-8000-NFPA 70-2024[Public Input No. 2537-NFPA 70-2023 \[Section No. 430.208\]](#)



First Revision No. 8001-NFPA 70-2024 [Section No. 430.245 [Excluding any Sub-Sections]]

Connection to the equipment grounding conductor shall be done in accordance with ~~Part VI~~ of Article 250, Part VI.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 15:57:42 EST 2024

Committee Statement

Committee Statement: Editorial change made for section to meet NEC Style manual section 4.1.4.

Response Message: FR-8001-NFPA 70-2024

Public Input No. 2707-NFPA 70-2023 [Section No. 430.245 [Excluding any Sub-Sections]]

**First Revision No. 8023-NFPA 70-2024 [Section No. 440.4(A)]****(A) Hermetic Refrigerant Motor-Compressor Nameplate.**

A hermetic refrigerant motor-compressor shall be provided with a visible nameplate that shall indicate the manufacturer's name, trademark, or symbol; identifying designation; phase; voltage; and frequency. The rated-load current in amperes of the motor-compressor shall be marked by the equipment manufacturer on either or both the motor-compressor nameplate and the nameplate of the equipment in which the motor-compressor is used. The locked-rotor current of each single-phase motor-compressor having a rated-load current of more than 9 amperes at 115 volts, or more than 4.5 amperes at 230 volts, and each polyphase motor-compressor shall be marked on the motor-compressor nameplate. Where a thermal protector complying with 440.52(A)(2) and (B)(2) is used, the motor-compressor nameplate or the equipment nameplate shall be marked with the words "thermally protected." Where a protective system complying with 440.52(A)(4) and (B)(4) is used and is furnished with the equipment, the equipment nameplate shall be marked with the words, "thermally protected system." Where a protective system complying with 440.52(A)(4) and (B)(4) is specified, the equipment nameplate shall be appropriately marked.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Thu Jan 18 17:24:40 EST 2024**Committee Statement**

Committee Statement: In order to facilitate ease of inspection, maintenance, and service, the nameplate for hermetic refrigerant motor-compressors is being required to be visible. The submitter did not provide specific substantiation for the requirement to make the nameplates accessible.

Response Message: FR-8023-NFPA 70-2024

Public Input No. 468-NFPA 70-2023 [Section No. 440.4]

**First Revision No. 8025-NFPA 70-2024 [Section No. 440.11]****440.11** General.

Disconnecting means shall be capable of disconnecting air-conditioning and refrigerating equipment, including motor-compressors and controllers, from the circuit conductors. If the disconnecting means is readily accessible to unqualified persons, any enclosure door or hinged cover of a disconnecting means enclosure that exposes energized parts when open shall have its door or cover locked or ~~require a tool to open or be capable of being locked~~ be opened .

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Thu Jan 18 17:42:40 EST 2024**Committee Statement****Committee Statement:** For the purpose of clarification, 440.11 is being revised to have similar language as 690.13(A)(2).**Response Message:** FR-8025-NFPA 70-2024[Public Input No. 1262-NFPA 70-2023 \[Section No. 440.11\]](#)[Public Input No. 2033-NFPA 70-2023 \[Section No. 440.11\]](#)

**First Revision No. 8045-NFPA 70-2024 [Section No. 440.12(A)(2)]****(2) Equivalent Horsepower.**

To determine the equivalent horsepower in complying with the requirements of 430.109, the horsepower rating shall be selected from Table 430.248, Table 430.249, or Table 430.250 corresponding to the rated-load current or branch-circuit selection current, whichever is greater, and also the horsepower rating from Table 430.251(A) ~~or~~ , Table 430.251(B), or Table 430.251(C) , corresponding to the locked-rotor current. In case the nameplate rated-load current or branch-circuit selection current and locked-rotor current do not correspond to the currents shown in Table 430.248, Table 430.249, Table 430.250, Table 430.251(A), ~~or~~ Table 430.251(B), or Table 430.251(C), the horsepower rating corresponding to the next higher value shall be selected. In case different horsepower ratings are obtained when applying these tables, a horsepower rating at least equal to the larger of the values obtained shall be selected.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Fri Jan 19 08:52:32 EST 2024**Committee Statement****Committee Statement:** A reference to Table 430.251(C) is being added to be consistent with revisions in Article 430 which adds a new Table 430.251(C).**Response Message:** FR-8045-NFPA 70-2024Public Input No. 1311-NFPA 70-2023 [Section No. 440.12(A)(2)]

**First Revision No. 8046-NFPA 70-2024 [Section No. 440.12(B)]****(B) Combination Loads.**

Where the combined load of two or more hermetic refrigerant motor-compressors or one or more hermetic refrigerant motor-compressor with other motors or loads may be simultaneous on a single disconnecting means, the rating for the disconnecting means shall be determined in accordance with 440.12(B)(1) and (B)(2).

(1) Horsepower Rating.

The horsepower rating of the disconnecting means shall be determined from the sum of all currents, including resistance loads, at the rated-load condition and also at the locked-rotor condition. The combined rated-load current and the combined locked-rotor current so obtained shall be considered as a single motor for the purpose of this requirement as required by 440.12(B)(1)(a) and (B)(1)(b).

(a) The full-load current equivalent to the horsepower rating of each motor, other than a hermetic refrigerant motor-compressor, and fan or blower motors as covered in 440.6(B) shall be selected from Table 430.248, Table 430.249, or Table 430.250. These full-load currents shall be added to the motor-compressor rated-load current(s) or branch-circuit selection current(s), whichever is greater, and to the rating in amperes of other loads to obtain an equivalent full-load current for the combined load.

(b) The locked-rotor current equivalent to the horsepower rating of each motor, other than a hermetic refrigerant motor-compressor, shall be selected from Table 430.251(A) or Table 430.251(B), or Table 430.251(C), and, for fan and blower motors of the shaded-pole or permanent split-capacitor type marked with the locked-rotor current, the marked value shall be used. The locked-rotor currents shall be added to the motor-compressor locked-rotor current(s) and to the rating in amperes of other loads to obtain an equivalent locked-rotor current for the combined load. Where two or more motors or other loads such as resistance heaters, or both, cannot be started simultaneously, appropriate combinations of locked-rotor and rated-load current or branch-circuit selection current, whichever is greater, shall be an acceptable means of determining the equivalent locked-rotor current for the simultaneous combined load.

Exception: Where part of the concurrent load is a resistance load and the disconnecting means is a switch rated in horsepower and amperes, the switch used shall be permitted to have a horsepower rating not less than the combined load to the motor-compressor(s) and other motor(s) at the locked-rotor condition, if the ampere rating of the switch is not less than this locked-rotor load plus the resistance load.

(2) Full-Load Current Equivalent.

The ampere rating of the disconnecting means shall be at least 115 percent of the sum of all currents at the rated-load condition determined in accordance with 440.12(B)(1).

Exception: A listed unfused motor circuit switch, without fuseholders, having a horsepower rating not less than the equivalent horsepower determined by 440.12(B)(1) shall be permitted to have an ampere rating less than 115 percent of the sum of all currents.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 08:55:16 EST 2024

Committee Statement

Committee Statement:	A reference to Table 430.251(C) is being added to be consistent with revisions in Article 430 which adds a new Table 430.251(C).
Response Message:	FR-8046-NFPA 70-2024

[Public Input No. 1308-NFPA 70-2023 \[Section No. 440.12\(B\)\(1\)\]](#)

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**First Revision No. 8026-NFPA 70-2024 [New Section after 440.14]****440.15 Split-System Disconnect Identification.**

In other than one- and two-family dwellings, in addition to the requirements of 110.22(A), the disconnecting means located at the exterior unit of a split-system HVAC shall identify the location of all indoor units supplied by the disconnect.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Thu Jan 18 18:10:07 EST 2024**Committee Statement**

Committee Statement: This would allow inspectors and installers to more quickly locate disconnect equipment for split-system HVAC interior units.

Response Message: FR-8026-NFPA 70-2024

[Public Input No. 1413-NFPA 70-2023 \[Section No. 440.11\]](#)

[Public Input No. 1765-NFPA 70-2023 \[Section No. 440.11\]](#)

**First Revision No. 8051-NFPA 70-2024 [Section No. 440.14]****440.14** Location.

Disconnecting means shall be located within sight from, and readily accessible from, the air-conditioning or refrigerating equipment. The disconnecting means shall be permitted to be installed on or within the air-conditioning or refrigerating equipment. Disconnecting means shall meet the working space requirements of 110.26(A).

The disconnecting means shall not be located on panels that are designed to allow access to the air-conditioning or refrigeration equipment or where it obscures the equipment nameplate(s).

Exception No. 1: Where the disconnecting means provided in accordance with 430.102(A) is lockable open in accordance with 110.25 and the refrigerating or air-conditioning equipment is essential to an industrial process in a facility with written safety procedures, and where the conditions of maintenance and supervision ensure that only qualified persons service the equipment, a disconnecting means within sight from the equipment shall not be required.

Exception No. 2: Where an attachment plug and receptacle serve as the disconnecting means in accordance with 440.13, their location shall be accessible but shall not be required to be readily accessible.

Informational Note: See Parts VII and IX of Article 430 for additional requirements.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 09:15:40 EST 2024

Committee Statement

Committee Statement: The term "lockable" is revised for compliance with 3.2.5 of the NEC Style Manual.

Response Message: FR-8051-NFPA 70-2024

Public Input No. 3015-NFPA 70-2023 [Section No. 440.14]

**First Revision No. 8056-NFPA 70-2024 [Section No. 440.31]****440.31** General.

Part IV and adjustments made in accordance with ~~Part III of~~ Article 310 , Part III specify ampacities of conductors required to carry the motor current without overheating under the conditions specified, except as modified in 440.6(A), Exception No. 1.

These articles shall not apply to integral conductors of motors, to motor controllers and the like, or to conductors that form an integral part of approved equipment.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 09:43:27 EST 2024

Committee Statement

Committee Statement: The reference to Part III of Article 310 is revised to comply with Part 4.1.4 of the NEC Style Manual.

Response Message: FR-8056-NFPA 70-2024

Public Input No. 2709-NFPA 70-2023 [Section No. 440.31]

**First Revision No. 8057-NFPA 70-2024 [Section No. 440.33]****440.33** Motor-Compressor(s) With or Without Additional Motor Loads.

Conductors supplying one or more motor-compressor(s) with or without an additional motor load(s) shall have an ampacity not less than the sum of each of the following:

- (1) The sum of the rated-load or branch-circuit selection current, whichever is greater, of all motor-compressor(s)
- (2) The sum of the full-load current rating of all other motors
- (3) 25 percent of the highest motor-compressor or motor full load current in the group

Exception No. 1: Where the circuitry is interlocked so as to prevent the starting and running of a second motor-compressor or group of motor-compressors, the conductor size shall be determined from the largest motor-compressor or group of motor-compressors that is to be operated at a given time.

Exception No. 2: The branch-circuit conductors for room air conditioners shall be in accordance with ~~Part VII of Article 440~~, Part VII.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 09:46:35 EST 2024

Committee Statement

Committee Statement: The reference to Part VII of Article 440 is revised to comply with Part 4.1.4 of the NEC Style Manual.

Response Message: FR-8057-NFPA 70-2024

Public Input No. 2710-NFPA 70-2023 [Section No. 440.33]

**First Revision No. 8058-NFPA 70-2024 [Section No. 440.41(A)]****(A) Motor-Compressor Controller.**

A motor-compressor controller shall have both a continuous-duty full-load current rating and a locked-rotor current rating not less than the nameplate rated-load current or branch-circuit selection current, whichever is greater, and locked-rotor current, respectively, of the compressor. In case the motor controller is rated in horsepower but is without one or both of the foregoing current ratings, equivalent currents shall be determined from the ratings as follows. Table 430.248, Table 430.249, and Table 430.250 shall be used to determine the equivalent full-load current rating. Table 430.251(A) and ~~Table 430.251(B), and Table 430.251(C)~~ shall be used to determine the equivalent locked-rotor current ratings.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Fri Jan 19 09:48:24 EST 2024**Committee Statement****Committee Statement:** A reference to Table 430.251(C) is being added to be consistent with revision in Article 430 which adds a new Table 430.251(C).**Response Message:** FR-8058-NFPA 70-2024[Public Input No. 1310-NFPA 70-2023 \[Section No. 440.41\(A\)\]](#)

**First Revision No. 8059-NFPA 70-2024 [Section No. 440.51]****440.51** General.

Part VI specifies devices intended to protect the motor-compressor, the motor-control apparatus, and the branch-circuit conductors against excessive heating due to motor overload and failure to start.

Informational Note: See 240.4(G) for application of Article 440, Parts III and VI- of Article 440.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 09:50:54 EST 2024

Committee Statement

Committee Statement: The reference to Parts III and VI of Article 440 is revised to comply with Part 4.1.4 of the NEC Style Manual.

Response Message: FR-8059-NFPA 70-2024

Public Input No. 2711-NFPA 70-2023 [Section No. 440.51]



First Revision No. 8062-NFPA 70-2024 [Section No. 440.54 [Excluding any Sub-Sections]]

Overload protection for motor-compressors and equipment used on 15- or 20-ampere 120-volt, or 15-ampere 208- or 240- or 277- volt, single-phase branch circuits shall be permitted in accordance with 440.54(A) and (B).

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 10:13:06 EST 2024

Committee Statement

Committee Statement: Single phase 277 volt (derived from 480/277 transformers) can be found in commercial and industrial properties.

Response Message: FR-8062-NFPA 70-2024

[Public Input No. 809-NFPA 70-2023 \[Section No. 440.54 \[Excluding any Sub-Sections\]\]](#)

**First Revision No. 8136-NFPA 70-2024 [New Section after 460.1]****460.3 Reconditioned Equipment.**

Reconditioned capacitors shall not be installed.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 14:56:33 EST 2024

Committee Statement

Committee Statement: Capacitors should not be reconditioned, in-line with NEMA Technical Position on Reconditioned Equipment (NEMA CS 100-2020, Appendix B.1). The numbering and wording is as required per 2.2.1 of the NEC Style Manual.

Response Message: FR-8136-NFPA 70-2024

Public Input No. 630-NFPA 70-2023 [New Section after 460.1]

**First Revision No. 8137-NFPA 70-2024 [Section No. 460.3]****460.3– 4** _ Enclosing and Guarding.**(A)** Containing More Than 11 L (3 gal) of Flammable Liquid.

Capacitors containing more than 11 L (3 gal) of flammable liquid shall be enclosed in vaults or outdoor fenced enclosures complying with Article 110, Part III. This limit shall apply to any single unit in an installation of capacitors.

(B) Accidental Contact.

Where capacitors are accessible to unauthorized and unqualified persons, they shall be enclosed, located, or guarded so that persons cannot come into accidental contact or bring conducting materials into accidental contact with exposed energized parts, terminals, or buses associated with them. However, no additional guarding is required for enclosures accessible only to authorized and qualified persons.

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Fri Jan 19 14:58:45 EST 2024**Committee Statement**

Committee Statement: This section is being re-numbered for compliance with 2.2.1 of the NEC Style Manual.

Response Message: FR-8137-NFPA 70-2024

Public Input No. 3755-NFPA 70-2023 [Section No. 460.3]

**First Revision No. 8144-NFPA 70-2024 [Section No. 460.8]****460.8** Conductors -

(A)–

- Ampacity.

The ampacity of capacitor circuit conductors shall not be less than 135 percent of the rated current of the capacitor. The ampacity of conductors that connect a capacitor to the terminals of a motor or to motor circuit conductors shall not be less than one-third the ampacity of the motor circuit conductors and in no case less than 135 percent of the rated current of the capacitor.

(B)–

460.9 Overcurrent Protection.

An overcurrent device shall be provided in each ungrounded conductor for each capacitor bank. The rating or setting of the overcurrent device shall be as low as practicable.

Exception: A separate overcurrent device shall not be required for a capacitor connected on the load side of a motor overload protective device.

(C)–

460.10 Disconnecting Means.

A disconnecting means shall be provided in each ungrounded conductor for each capacitor bank and shall meet the following requirements:

- (1) The disconnecting means shall open all ungrounded conductors simultaneously.
- (2) The disconnecting means shall be permitted to disconnect the capacitor from the line as a regular operating procedure.
- (3) The rating of the disconnecting means shall not be less than 135 percent of the rated current of the capacitor.

Exception: A separate disconnecting means shall not be required where a capacitor is connected on the load side of a motor controller.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-8144_460.8.docx	For Staff Use	

Submitter Information Verification**Committee:** NEC-P11**Submittal Date:** Fri Jan 19 15:16:59 EST 2024**Committee Statement**

Committee Statement: The requirements of 460.8 are being split into three sections to increase usability of the code.

Response Message: FR-8144-NFPA 70-2024

WORKING DRAFT OF PANEL MEETING OUTPUT
NEC CMP-11, January 18-20, 2024, Subject to Revision - Not for Publication

[Public Input No. 2172-NFPA 70-2023 \[Section No. 460.8\]](#)

[Public Input No. 2197-NFPA 70-2023 \[Section No. 460.9\]](#)

[Public Input No. 2198-NFPA 70-2023 \[Section No. 460.10\]](#)

[Public Input No. 2200-NFPA 70-2023 \[Section No. 460.12\]](#)

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SUBJECT TO REVISION - NOT FOR PUBLICATION

**First Revision No. 8148-NFPA 70-2024 [Section No. 470.2]**

470.2– 3 _ Reconditioned Equipment.

(A)– Resistors _ Permitted to be Installed .

Reconditioned ~~resistors~~ reactors shall ~~not~~ be permitted to be installed .

(B)– Reactors _ Not Permitted to be Installed .

Reconditioned ~~reactors~~ resistors shall not be ~~permitted~~ installed .

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Jan 19 15:23:21 EST 2024

Committee Statement

Committee Statement: Change is for compliance with the parallel numbering provisions in section 2.2.1 of the NEC Style Manual.

Response Message: FR-8148-NFPA 70-2024

Public Input No. 2611-NFPA 70-2023 [Section No. 470.2]

Public Input No. 3777-NFPA 70-2023 [Section No. 470.2]



First Revision No. 8006-NFPA 70-2024 [Part XIV.]

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

[SEE ATTACHED WORD FILE FOR NEW TABLE 430.251(C) TO FOLLOW TABLE 430.251(B)]

Part XIV. Tables

FOR COMMITTEE USE ONLY
SUBJECT TO REVISION - NOT FOR PUBLICATION

Table 430.247 Full-Load Current in Amperes, Direct-Current Motors

The following values of full-load currents* are for motors running at base speed.

<u>Horsepower</u>	<u>Armature Voltage Rating*</u>					
	<u>90 Volts</u>	<u>120 Volts</u>	<u>180 Volts</u>	<u>240 Volts</u>	<u>500 Volts</u>	<u>550 Volts</u>
¼	4.0	3.1	2.0	1.6	—	—
⅓	5.2	4.1	2.6	2.0	—	—
½	6.8	5.4	3.4	2.7	—	—
¾	9.6	7.6	4.8	3.8	—	—
1	12.2	9.5	6.1	4.7	—	—
1½	—	13.2	8.3	6.6	—	—
2	—	17	10.8	8.5	—	—
3	—	25	16	12.2	—	—
5	—	40	27	20	—	—
7½	—	58	—	29	13.6	12.2
10	—	76	—	38	18	16
15	—	—	—	55	27	24
20	—	—	—	72	34	31
25	—	—	—	89	43	38
30	—	—	—	106	51	46
40	—	—	—	140	67	61
50	—	—	—	173	83	75
60	—	—	—	206	99	90
75	—	—	—	255	123	111
100	—	—	—	341	164	148
125	—	—	—	425	205	185
150	—	—	—	506	246	222
200	—	—	—	675	330	294

*These are average dc quantities.

Table 430.248 Full-Load Currents in Amperes, Single-Phase Alternating-Current Motors

The following values of full-load currents are for motors running at usual speeds and motors with normal torque characteristics. The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120 and 220 to 240 volts.

<u>Horsepower</u>	<u>115</u>	<u>200</u>	<u>208</u>	<u>230</u>
	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>
⅙	4.4	2.5	2.4	2.2
¼	5.8	3.3	3.2	2.9
⅓	7.2	4.1	4.0	3.6
½	9.8	5.6	5.4	4.9
¾	13.8	7.9	7.6	6.9
1	16	9.2	8.8	8.0
1½	20	11.5	11.0	10
2	24	13.8	13.2	12

<u>Horsepower</u>	<u>115</u>	<u>200</u>	<u>208</u>	<u>230</u>
	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>
3	34	19.6	18.7	17
5	56	32.2	30.8	28
7½	80	46.0	44.0	40
10	100	57.5	55.0	50

Table 430.249 Full-Load Current, Two-Phase Alternating-Current Motors (4-Wire)

The following values of full-load current are for motors running at speeds usual for belted motors and motors with normal torque characteristics. Current in the common conductor of a 2-phase, 3-wire system will be 1.41 times the value given. The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120, 220 to 240, 440 to 480, 550 to 600, and 2300 to 2400 volts.

<u>Induction-Type Squirrel Cage and</u>					
<u>Horsepower</u>	<u>Wound Rotor (Amperes)</u>				
	<u>115</u>	<u>230</u>	<u>460</u>	<u>575</u>	<u>2300</u>
	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>	<u>Volts</u>
½	4.0	2.0	1.0	0.8	—
¾	4.8	2.4	1.2	1.0	—
1	6.4	3.2	1.6	1.3	—
1½	9.0	4.5	2.3	1.8	—
2	11.8	5.9	3.0	2.4	—
3	—	8.3	4.2	3.3	—
5	—	13.2	6.6	5.3	—
7½	—	19	9.0	8.0	—
10	—	24	12	10	—
15	—	36	18	14	—
20	—	47	23	19	—
25	—	59	29	24	—
30	—	69	35	28	—
40	—	90	45	36	—
50	—	113	56	45	—
60	—	133	67	53	14
75	—	166	83	66	18
100	—	218	109	87	23
125	—	270	135	108	28
150	—	312	156	125	32
200	—	416	208	167	43

Table 430.250 Full-Load Current, Three-Phase Alternating-Current Motors

The following values of full-load currents are typical for motors running at speeds usual for belted motors and motors with normal torque characteristics. The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120, 220 to 240, 440 to 480, 550 to 600, and 2300 to 2400 volts.

<u>Horsepower</u>	<u>Induction-Type Squirrel Cage and Wound Rotor (Amperes)</u>							
	<u>115 Volts</u>	<u>200 Volts</u>	<u>208 Volts</u>	<u>230 Volts</u>	<u>460 Volts</u>	<u>575 Volts</u>	<u>2300 Volts</u>	
½	4.4	2.5	2.4	2.2	1.1	0.9	—	-
¾	6.4	3.7	3.5	3.2	1.6	1.3	—	-
1	8.4	4.8	4.6	4.2	2.1	1.7	—	-
1½	12.0	6.9	6.6	6.0	3.0	2.4	—	-
2	13.6	7.8	7.5	6.8	3.4	2.7	—	-
3	—	11.0	10.6	9.6	4.8	3.9	—	-
5	—	17.5	16.7	15.2	7.6	6.1	—	-
7½	—	25.3	24.2	22	11	9	—	-
10	—	32.2	30.8	28	14	11	—	-
15	—	48.3	46.2	42	21	17	—	-
20	—	62.1	59.4	54	27	22	—	-
25	—	78.2	74.8	68	34	27	—	- 53
30	—	92	88	80	40	32	—	- 63
40	—	120	114	104	52	41	—	- 83
50	—	150	143	130	65	52	—	- 10
60	—	177	169	154	77	62	16	- 12
75	—	221	211	192	96	77	20	- 15
100	—	285	273	248	124	99	26	- 20
125	—	359	343	312	156	125	31	- 25
150	—	414	396	360	180	144	37	- 30
200	-	—	552	528	480	240	192	49 -
250	—	—	—	—	302	242	60	-
300	—	—	—	—	361	289	72	-
350	—	—	—	—	414	336	83	-
400	—	—	—	—	477	382	95	-
450	—	—	—	—	515	412	103	-
500	—	—	—	—	590	472	118	-

*For 90 and 80 percent power factor, the figures shall be multiplied by 1.1 and 1.25, respectively.

Table 430.251(A) Conversion Table of Single-Phase Locked-Rotor Currents for Selection of Disconnecting Means and Controllers as Determined from Horsepower and Voltage Rating

For use only with 430.110, 440.12, 440.41, and 455.8(C).

<u>Rated Horsepower</u>	<u>Maximum Locked-Rotor Current in Amperes, Single-Phase</u>		
	<u>115 Volts</u>	<u>208 Volts</u>	<u>230 Volts</u>
½	58.8	32.5	29.4
¾	82.8	45.8	41.4
1	96	53	48
1½	120	66	60

<u>Rated</u> <u>Horsepower</u>	<u>Maximum Locked-Rotor Current in</u> <u>Amperes, Single-Phase</u>		
	<u>115 Volts</u>	<u>208 Volts</u>	<u>230 Volts</u>
2	144	80	72
3	204	113	102
5	336	186	168
7½	480	265	240
10	1000	332	300

Table 430.251(B) Conversion Table of Polyphase Design B, C, and D Maximum Locked-Rotor Currents for Selection of Disconnecting Means and Controllers as Determined from Horsepower and Voltage Rating and Design Letter

For use only with 430.110, 440.12, 440.41, and 455.8(C).

<u>Rated</u> <u>Horsepower</u>	<u>Maximum Motor Locked-Rotor Current in Amperes,</u> <u>Two- and Three-Phase, Design B, C, and D*</u>											
	<u>115 Volts</u>		<u>200 Volts</u>		<u>208 Volts</u>		<u>230 Volts</u>		<u>460 Volts</u>		<u>575 Volts</u>	
	<u>B, C, D</u>		<u>B, C, D</u>		<u>B, C, D</u>		<u>B, C, D</u>		<u>B, C, D</u>		<u>B, C, D</u>	
½	40	-	23	-	22.1	-	20	-	10	-	8	
¾	50	-	28.8	-	27.6	-	25	-	12.5	-	10	
1	60	-	34.5	-	33	-	30	-	15	-	12	
1½	80	-	46	-	44	-	40	-	20	-	16	
2	100	-	57.5	-	55	-	50	-	25	-	20	
3	—	-	73.6	-	71	-	64	-	32	-	25.6	
5	—	-	105.8	-	102	-	92	-	46	-	36.8	
7½	—	-	146	-	140	-	127	-	63.5	-	50.8	
10	—	-	186.3	-	179	-	162	-	81	-	64.8	
15	—	-	267	-	257	-	232	-	116	-	93	
20	—	-	334	-	321	-	290	-	145	-	116	
25	—	-	420	-	404	-	365	-	183	-	146	
30	—	-	500	-	481	-	435	-	218	-	174	
40	—	-	667	-	641	-	580	-	290	-	232	
50	—	-	834	-	802	-	725	-	363	-	290	
60	—	-	1001	-	962	-	870	-	435	-	348	
75	—	-	1248	-	1200	-	1085	-	543	-	434	
100	—	-	1668	-	1603	-	1450	-	725	-	580	
125	—	-	2087	-	2007	-	1815	-	908	-	726	
150	—	-	2496	-	2400	-	2170	-	1085	-	868	
200	—	-	3335	-	3207	-	2900	-	1450	-	1160	
250	—	-	—	-	—	-	—	-	1825	-	1460	
300	—	-	—	-	—	-	—	-	2200	-	1760	
350	—	-	—	-	—	-	—	-	2550	-	2040	
400	—	-	—	-	—	-	—	-	2900	-	2320	
450	—	-	—	-	—	-	—	-	3250	-	2600	
500	—	-	—	-	—	-	—	-	3625	-	2900	

*Design A motors are not limited to a maximum starting current or locked rotor current.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP11_FR-8006_430.251_PartXIV.docx		
NEC_CMP11_FR-8006_430.251_PartXIV-new.docx	For prod use	

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Thu Jan 18 16:16:34 EST 2024

Committee Statement

Committee Statement: The addition of the new design BE and CE energy efficiency motors is the basis for the sizing of related components. The data in this table is based on the draft NEMA MG1 document slated to be published after the conclusion of this meeting. These motor designs have been developed to meet DOE requirements for energy efficiency.

Response Message: FR-8006-NFPA 70-2024

Public Input No. 1472-NFPA 70-2023 [Part XIV.]

Table 430.251(C) Conversion Table of Polyphase Design BE and CE Maximum Locked-Rotor Currents for Selection of Disconnecting Means and Controllers as Determined from Horsepower and Voltage Rating and Design Letter

For use only with 430.110, 440.12, 440.41, and 455.8(C).

Maximum Motor Locked-Rotor Current in Amperes, Two- and Three-Phase, Design BE and CE						
<u>Rated Horsepower</u>	<u>115 Volts BE, CE</u>	<u>200 Volts BE, CE</u>	<u>208 Volts BE, CE</u>	<u>230 Volts BE, CE</u>	<u>460 Volts BE, CE</u>	<u>575 Volts BE, CE</u>
<u>1/2</u>	<u>41.2</u>	<u>23.7</u>	<u>22.8</u>	<u>20.6</u>	<u>10.3</u>	<u>8.2</u>
<u>3/4</u>	<u>53.3</u>	<u>30.7</u>	<u>29.5</u>	<u>26.7</u>	<u>13.3</u>	<u>10.7</u>
<u>1</u>	<u>63.6</u>	<u>36.6</u>	<u>35.2</u>	<u>31.8</u>	<u>15.9</u>	<u>12.7</u>
<u>1 1/2</u>	<u>84.2</u>	<u>48.4</u>	<u>46.6</u>	<u>42.1</u>	<u>21.1</u>	<u>16.8</u>
<u>2</u>	<u>112</u>	<u>64.6</u>	<u>62.1</u>	<u>56.2</u>	<u>28.1</u>	<u>22.5</u>
<u>3</u>		<u>96.9</u>	<u>93.1</u>	<u>84.2</u>	<u>42.1</u>	<u>33.7</u>
<u>5</u>		<u>161</u>	<u>155</u>	<u>140</u>	<u>70.2</u>	<u>56.2</u>
<u>7 1/2</u>		<u>242</u>	<u>233</u>	<u>211</u>	<u>105</u>	<u>84.2</u>
<u>10</u>	-	<u>301</u>	<u>290</u>	<u>262</u>	<u>131</u>	<u>105</u>
<u>15</u>		<u>452</u>	<u>435</u>	<u>393</u>	<u>197</u>	<u>157</u>
<u>20</u>		<u>603</u>	<u>580</u>	<u>524</u>	<u>262</u>	<u>210</u>
<u>25</u>		<u>753</u>	<u>724</u>	<u>655</u>	<u>328</u>	<u>262</u>
<u>30</u>		<u>904</u>	<u>869</u>	<u>786</u>	<u>393</u>	<u>314</u>
<u>40</u>		<u>1119</u>	<u>1076</u>	<u>973</u>	<u>487</u>	<u>389</u>
<u>50</u>	-	<u>1399</u>	<u>1345</u>	<u>1217</u>	<u>608</u>	<u>487</u>
<u>60</u>		<u>1679</u>	<u>1614</u>	<u>1460</u>	<u>730</u>	<u>584</u>
<u>75</u>		<u>2099</u>	<u>2018</u>	<u>1825</u>	<u>913</u>	<u>730</u>
<u>100</u>		<u>2583</u>	<u>2484</u>	<u>2246</u>	<u>1123</u>	<u>898</u>
<u>125</u>		<u>3229</u>	<u>3105</u>	<u>2808</u>	<u>1404</u>	<u>1123</u>
<u>150</u>		<u>3875</u>	<u>3726</u>	<u>3369</u>	<u>1685</u>	<u>1348</u>
<u>200</u>		<u>5166</u>	<u>4968</u>	<u>4492</u>	<u>2246</u>	<u>1797</u>
<u>250</u>	-	-	-	-	<u>2808</u>	<u>2246</u>
<u>300</u>					<u>3369</u>	<u>2695</u>
<u>350</u>					<u>3931</u>	<u>3145</u>
<u>400</u>					<u>4492</u>	<u>3594</u>
<u>450</u>					<u>5054</u>	<u>4043</u>
<u>500</u>	-	-	-	-	<u>5616</u>	<u>4492</u>

Informational Note: Values in Table 430.251 (C) should be carefully considered when replacing Design B, C, or D motors with Design BE or CE motors, which are capable of higher efficiency levels. Motor control devices tested for Design B, C, or D motors, such as those covered in UL 508 and UL 60947-4-1, may not have been evaluated to these higher locked rotor current values.