



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
SECOND DRAFT REPORT**

Document: National Electrical Code®

Revision Cycle: A2025

Meeting Date: October 2024

Panel Activity: Comment Stage

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



Second Revision No. 8086-NFPA 70-2024 [Global Comment]

See attached word document for updates to the terms “overcurrent”, “overcurrent protective devices” and “overcurrent protection” in Articles 409, 430, 440, and 460, Part II.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_CMP11_OCPDGlobal_SR8086.docx		

Submitter Information Verification

Committee: NEC-P11
Submittal Date: Sat Oct 19 11:50:23 EDT 2024

Committee Statement

Committee Statement: During the review of the overcurrent language, the panel agrees with recommendations with some exceptions.

Modifications to the request in the public comment include:

409.21(B) – remove “this” from title and change one more reference to OCPD.

409.21(C) – change 2 references to OCPD.

440.52(B) – no change was made as this would make the sentence grammatically incorrect.

Additional changes were made to clarify the protection needed in 430.111 (A) and in the exception in 430.112. The recommended change to 430.206 (B)(2) was reworded to improve clarity. The CC request to review 430.206 (C) was completed but no change was needed.

Response Message: SR-8086-NFPA 70-2024

[Public Comment No. 1651-NFPA 70-2024 \[Global Input\]](#)

409.21(B)

(B) Location.

~~This Overcurrent~~-protection shall be provided for each incoming supply circuit by either of the following:

- (1) An ~~overcurrent protective device~~OCPD located ahead of the industrial control panel.
- (2) A single main ~~overcurrent protective device~~OCPD located within the industrial control panel. Where overcurrent protection is provided as part of the industrial control panel, the supply conductors shall be considered as either feeders or taps as covered by 240.21.

409.21(C)

(C) Rating.

The rating or setting of the ~~overcurrent protective device~~OCPD for the circuit supplying the industrial control panel shall not be greater than the sum of the largest rating or setting of the branch-circuit short-circuit and ground-fault protective device provided with the industrial control panel, plus 125 percent of the full-load current rating of all resistance heating loads, plus the sum of the full-load currents of all other motors and apparatus that could be in operation at the same time.

Exception: Where one or more instantaneous trip circuit breakers or motor short-circuit protectors are used for motor branch-circuit short-circuit and ground-fault protection as permitted by 430.52(C), the procedure specified above for determining the maximum rating of the ~~protective device~~OCPD for the circuit supplying the industrial control panel shall apply with the following provision: For the purpose of the calculation, each instantaneous trip circuit breaker or motor short-circuit protector shall be assumed to have a rating not exceeding the maximum percentage of motor full-load current permitted by Table 430.52(C)(1) for the type of control panel supply circuit ~~protective device~~OCPD employed.

Where no branch-circuit short-circuit and ground-fault protective device is provided with the industrial control panel for motor or combination of motor and non-motor loads, the rating or setting of the ~~overcurrent protective device~~OCPD shall be based on 430.52 and 430.53, as applicable.

409.104(A)

(A) General.

Industrial control panel enclosures shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or ~~overcurrent devices~~OCPDs or other equipment, unless the conductors fill less than 40 percent of the cross-sectional area of the wiring space. In addition, the conductors, splices, and taps shall not fill the wiring space at any cross section to more than 75 percent of the cross-sectional area of that space.

430.10(A)

430.10 Wiring Space in Enclosures.

(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 312.11 for switch and ~~overcurrent device~~OCPD enclosures.

430.28

430.28 Feeder Taps.

Feeder tap conductors shall have an ampacity not less than that required by Part II, shall terminate in a ~~branch-circuit protective device~~OCPD, and, in addition, shall meet one of the following requirements:

- (1) Be enclosed either by an enclosed controller or by a raceway, be not more than 3.0 m (10 ft) in length, and, for field installation, be protected by an ~~overcurrent device~~OCPD on the line side of the tap conductor, the rating or setting of which shall not exceed 1000 percent of the tap conductor ampacity
- (2) Have an ampacity of at least one-third that of the feeder conductors, be suitably protected from physical damage or enclosed in a raceway, and be not more than 7.5 m (25 ft) in length
- (3) Have an ampacity not less than the feeder conductors

Exception: Feeder taps over 7.5 m (25 ft) long. In high-bay manufacturing buildings [over 11 m (35 ft) high at walls], where conditions of maintenance and supervision ensure that only qualified persons service the systems, conductors tapped to a feeder shall be permitted to be not over 7.5 m (25 ft) long horizontally and not over 30.0 m (100 ft) in total length where all of the following conditions are met:

- (1) The ampacity of the tap conductors is not less than one-third that of the feeder conductors.*
- (2) The tap conductors terminate with a single circuit breaker or a single set of fuses complying with (1) Part IV, where the load-side conductors are a branch circuit, or (2) Part V, where the load-side conductors are a feeder.*
- (3) The tap conductors are suitably protected from physical damage and are installed in raceways.*
- (4) The tap conductors are continuous from end-to-end and contain no splices.*
- (5) The tap conductors shall be 6 AWG copper or 4 AWG aluminum or larger.*
- (6) The tap conductors shall not penetrate walls, floors, or ceilings.*
- (7) The tap shall not be made less than 9.0 m (30 ft) from the floor.*

430.62

430.62 Rating or Setting — Motor Load.

(A) Specific Load.

A feeder supplying a specific fixed motor load(s) and consisting of conductor sizes in accordance with 430.24 shall be provided with a protective device having a rating or setting not greater than the largest rating or setting of the branch-circuit short-circuit and ground-fault protective device for any motor supplied by the feeder [based on the maximum permitted value for the specific type of protective device in accordance with 430.52, or 440.22(A) for hermetic refrigerant motor-compressors], plus the sum of the full-load currents of the other motors of the group.

Where the same rating or setting of the branch-circuit short-circuit and ground-fault protective device is used on two or more of the branch circuits supplied by the feeder, one of the protective devices shall be considered the largest for the above calculations.

Exception No. 1: Where one or more instantaneous-trip circuit breakers or motor short-circuit protectors are used for motor branch-circuit short-circuit and ground-fault protection as permitted in 430.52(C), the maximum rating of each instantaneous-trip circuit breaker or motor short-circuit protector shall be assumed to have a rating not exceeding the maximum percentage of motor full-load current permitted by Table 430.52(C)(1) for the type of feeder protective device employed.

Exception No. 2: Where the feeder ~~overcurrent protective device~~OCPD also provides overcurrent protection for a motor control center, the provisions of 430.94 shall apply.

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

(B) Other Installations.

Where feeder conductors have an ampacity greater than required by 430.24, the rating or setting of the feeder ~~overcurrent protective device~~OCPD shall be permitted to be based on the ampacity of the feeder conductors.

430.63

430.63 Rating or Setting — Motor Load and Other Load(s).

Where a feeder supplies a motor load and other load(s), the feeder protective device shall have a rating not less than that required for the sum of the other load(s) plus the following:

- (1) For a single motor, the rating permitted by 430.52
- (2) For a single hermetic refrigerant motor-compressor, the rating permitted by 440.22
- (3) For two or more motors, the rating permitted by 430.62

Exception: Where the feeder ~~overcurrent device~~OCPD provides the overcurrent protection for a motor control center, the provisions of 430.94 shall apply.

430.72

430.72 Overcurrent Protection.

(A) General.

A motor control circuit tapped from the load side of a motor branch-circuit short-circuit and ground-fault protective device(s) and functioning to control the motor(s) connected to that branch circuit shall be protected against overcurrent in accordance with 430.72. Such a tapped control circuit shall not be considered to be a branch circuit and shall be permitted to be protected by either a supplementary or branch-circuit overcurrent protective device(s). A motor control circuit other than such a tapped control circuit shall be ~~protected against~~provided with overcurrent protection in accordance with 724.43 or the notes to Table 11(A) and Table 11(B) in Chapter 9, as applicable.

(B) Conductor Protection.

The overcurrent protection for conductors shall be provided as specified in 430.72(B)(1) or 430.72(B)(2).

Exception No. 1: Where the opening of the control circuit would create a hazard as, for example, the control circuit of a fire pump motor, and the like, conductors of control circuits shall require only short-circuit and ground-fault protection and shall be permitted to be protected by the motor branch-circuit short-circuit and ground-fault protective device(s).

Exception No. 2: Conductors supplied by the secondary side of a single-phase transformer having only a two-wire (single-voltage) secondary shall be permitted to be protected by overcurrent protection provided on the primary (supply) side of the transformer, provided this protection does not exceed the value determined by multiplying the appropriate maximum rating of the ~~overcurrent device~~OCPD for the secondary conductor from Table 430.72(B)(2) by the secondary-to-primary voltage ratio. Transformer secondary conductors (other than two-wire) shall not be considered to be protected by the primary overcurrent protection.

(1) Separate Overcurrent Protection.

Where the motor branch-circuit short-circuit and ground-fault protective device does not provide protection in accordance with 430.72(B)(2), separate overcurrent protection shall be provided. The overcurrent protection shall not exceed the values specified in Column A of Table 430.72(B)(2).

(2) Branch-Circuit Overcurrent Protective Device.

Conductors shall be permitted to be protected by the motor branch-circuit short-circuit and ground-fault protective device and shall require only short-circuit and ground-fault protection. Where the conductors do not extend beyond the motor control equipment enclosure, the rating of the ~~protective device(s)~~OCPDs shall not exceed the value

specified in Column B of Table 430.72(B)(2). Where the conductors extend beyond the motor control equipment enclosure, the rating of the ~~protective device(s)~~OCPDs shall not exceed the value specified in Column C of Table 430.72(B)(2).

(C) Control Circuit Transformer.

Where a motor control circuit transformer is provided, the transformer shall be protected in accordance with 430.72(C)(1), 430.72(C)(2), 430.72(C)(3), 430.72(C)(4), or 430.72(C)(5).

Exception: Overcurrent protection shall be omitted where the opening of the control circuit would create a hazard as, for example, the control circuit of a fire pump motor and the like.

(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 Article 240, Part II.

(2) Transformers.

Protection shall be permitted to be provided in accordance with 450.5.

(3) Less Than 50 Volt-Amperes.

Control circuit transformers rated less than 50 volt-amperes (VA) and that are an integral part of the motor controller and located within the motor controller enclosure shall be permitted to be protected by primary ~~overcurrent devices~~OCPDs, impedance limiting means, or other inherent protective means.

(4) Primary Less Than 2 Amperes.

Where the control circuit transformer rated primary current is less than 2 amperes, an ~~overcurrent device~~OCPD rated or set at not more than 500 percent of the rated primary current shall be permitted in the primary circuit.

(5) Other Means.

~~Protection-Overcurrent protection~~ shall be permitted to be provided by other approved means.

430.87

430.87 Number of Motors Served by Each Motor Controller.

Each motor shall be provided with an individual motor controller.

Exception No. 1: For motors rated 1000 volts or less, a single motor controller rated at not less than the equivalent horsepower, as determined in accordance with 430.110(C)(1), of all the motors in the group shall be permitted to serve the group under any of the following conditions:

- (1) Where a number of motors drive several parts of a single machine or piece of apparatus, such as metal and woodworking machines, cranes, hoists, and similar apparatus*
- (2) Where a group of motors is under the protection of one ~~overcurrent device~~OCPD in accordance with 430.53(A)*
- (3) Where a group of motors is located in a single room within sight from the motor controller location*

Exception No. 2: A branch-circuit disconnecting means serving as the motor controller in accordance with 430.81(A) shall be permitted to serve more than one motor.

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. The ampere rating or setting of the ~~overcurrent protective device~~OCPD shall not exceed the rating of the common power bus. This protection shall be provided by (1) an ~~overcurrent protective device~~OCPD located ahead of the motor control center or (2) a main ~~overcurrent protective device~~OCPD located within the motor control center.

430.109(B)

(B) Stationary Motors of $\frac{1}{8}$ Horsepower or Less.

For stationary motors of $\frac{1}{8}$ hp or less, the branch-circuit ~~overcurrent device~~OCPD shall be permitted to serve as the disconnecting means.

430.111(A)

430.111 Switch or Circuit Breaker as Both Motor Controller and Disconnecting Means.

A switch or circuit breaker shall be permitted to be used as both the motor controller and disconnecting means if it complies with 430.111(A) and is one of the types specified in 430.111(B).

(A) General.

The switch or circuit breaker complies with the requirements for motor controllers specified in 430.83, opens all ungrounded conductors to the motor, and is protected by an ~~overcurrent device~~OCPD in each ungrounded conductor (which shall be permitted to be the branch-circuit fuses). The ~~overcurrent device~~OCPD protecting the motor controller shall be permitted to be part of the motor controller assembly or shall be permitted to be separate. An autotransformer-type motor controller shall be provided with a separate disconnecting means.

430.112

430.112 Motors Served by Single Disconnecting Means.

Each motor shall be provided with an individual disconnecting means.

Exception: A single disconnecting means shall be permitted to serve a group of motors under any one of the conditions of (1), (2), and (3). The single disconnecting means shall be rated in accordance with 430.110(C).

- (1) *Where a number of motors drive several parts of a single machine or piece of apparatus, such as metal- and woodworking machines, cranes, and hoists.*
- (2) *Where a group of motors is under the protection of one set of branch-circuit short-circuit and ground-fault protective devices as permitted by 430.53(A).*
- (3) *Where a group of motors is in a single room within sight from the location of the disconnecting means.*

430.206(B)(2)

(2) Wound-Rotor Alternating-Current Motors.

The secondary circuits of wound-rotor ac motors, including conductors, motor controllers, and resistors rated for the application, shall be considered ~~as~~ protected ~~against overcurrent~~ by the motor overload protection means.

440.22(B)(2)

(2) Motor-Compressor Not Largest Load.

Where a hermetic refrigerant motor-compressor is not the largest load connected to the circuit, the rating or setting of the branch-circuit short-circuit and ground-fault protective device shall not exceed a value equal to the sum of the rated-load current or branch-circuit selection current, whichever is greater, rating(s) for the motor-compressor(s) plus the value specified in 430.53(C)(4) where other motor loads are supplied, or the value specified in 240.4 where only nonmotor loads are supplied in addition to the motor-compressor(s).

Exception No. 1: Equipment that starts and operates on a 15- or 20-ampere 120-volt, or 15-ampere 208- or 240-volt single-phase branch circuit, shall be permitted to be protected by the 15- or 20-ampere ~~overcurrent device~~OCPD protecting the branch circuit, but if the maximum branch-circuit short-circuit and ground-fault protective device rating marked on the equipment is less than these values, the circuit protective device shall not exceed the value marked on the equipment nameplate.

Exception No. 2: The nameplate marking of cord-and-plug-connected equipment rated not greater than 250 volts, single-phase, such as household refrigerators and freezers, drinking water coolers, and beverage dispensers, shall be used in determining the branch-circuit requirements, and each unit shall be considered as a single motor unless the nameplate is marked otherwise.

460.9

460.9 Overcurrent Protection.

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

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



Second Revision No. 8084-NFPA 70-2024 [Detail]

[Update edition years in Annex A Table A.1(b)]

409	<u>UL 1436, sixth edition</u>	Outlet Circuit Testers and Other Similar Indicating Devices
	<u>UL 61010-1, third edition</u>	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 1: General Requirements
	<u>UL 61010-2-030, second edition</u>	Electrical Equipment for Measurement, Control, and Laboratory Use — Part 2-30: Particular Requirements for Testing and Measuring Circuits

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Sat Oct 19 11:42:46 EDT 2024

Committee Statement

Committee Statement: Edition dates are added to the standards that were added to Table A.1(b) during first draft stage under FR 8154.

Response Message: SR-8084-NFPA 70-2024

[Public Comment No. 374-NFPA 70-2024 \[Section No. A.1\]](#)



Second Revision No. 8063-NFPA 70-2024 [Section No. 409.23]

409.23 Source(s) of Supply.

(A) Identification.

~~Industrial control panels shall identify the location~~ Identification of the ~~means necessary to location to~~ disconnect all sources of supply 50 volts or more ~~marked~~ shall be required by one of the following:

(1) Marked on industrial control panels in accordance with ~~409.110.23.21 (C)~~ or documented B).

(2) 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 in accordance with 110.21(B) 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 409.23(A) or 409.23(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~~

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_CMP11_409.23_SR8063.docx	For Staff Use	
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Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 18:45:22 EDT 2024

Committee Statement

Committee Statement: The wording in 409.23(C) is redundant to 110.21(B), therefore 409.23(C) is replaced by a reference to 110.21(B). Section 409.23(A) is arranged into a list for clarity (ref 2.1.8 of the style manual).

Additional response for PC-1360: It is the intent of the requirement to have an option of marking on the product or using documentation available to persons. The first sentence is re-worded for clarity.

Response Message: SR-8063-NFPA 70-2024

[Public Comment No. 1360-NFPA 70-2024 \[Section No. 409.23\]](#)

[Public Comment No. 2005-NFPA 70-2024 \[Section No. 409.23\(C\)\]](#)

[Public Comment No. 376-NFPA 70-2024 \[Section No. 409.22\]](#)

[Public Comment No. 2004-NFPA 70-2024 \[Section No. 409.23\(A\)\]](#)



Second Revision No. 8067-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 409.110(3) shall be attached to the outside of the enclosure. The markings in 409.110(1), 409.110(4), 409.110(5), and 409.110(6) 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) Short-circuit current rating of the industrial control panel based on one of the following:
 - (4) Short-circuit current rating of a listed and labeled assembly.
 - (5) Short-circuit current rating established utilizing an approved method

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

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

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

Supplemental Information

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Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 19:04:45 EDT 2024

Committee Statement

Committee Statement: The exception to item 3 was inadvertently removed during the development of the first draft. The verbiage from the 2023 code is being re-introduced.

Response Message: SR-8067-NFPA 70-2024

Public Comment No. 1780-NFPA 70-2024 [Section No. 409.110]



Second Revision No. 8000-NFPA 70-2024 [Section No. 430.3]

430.3 Reconditioned ~~Motors~~ Equipment .

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 for use in hazardous (classified) locations shall be 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: Fri Oct 18 11:56:00 EDT 2024

Committee Statement

Committee Statement: Title changed per NEC style manual and second paragraph deleted as it is redundant language.

Response Message: SR-8000-NFPA 70-2024

Public Comment No. 381-NFPA 70-2024 [Section No. 430.3]



Second Revision No. 8012-NFPA 70-2024 [New Section after 430.22(G)]

[See attached Word file for New Section 430.22(H)]

430.22(H) Design BE and CE Motors.

Conductors that supply a single Design BE or CE motor used in a continuous duty application shall have an ampacity of not less than 125 percent of the motor full-load current rating, as determined by 430.6(A)(1). Conductors that supply a single Design BE or CE motor used in an application other than continuous duty shall have an ampacity per 430.22(E).

The sizing of any thermoplastic insulated or thermoset insulated copper or aluminum conductors with a temperature rating of 90°C (194°F) or less supplying a single Design BE or CE motor shall additionally limit the temperature of the conductors to a value not exceeding the insulation damage temperature of the conductors when locked-rotor current equal to that in Table 430.251(C) for the corresponding motor horsepower and voltage rating is drawn for a time duration of 5 seconds with the conductors initially at their rated maximum operating temperature. The temperature is limited in this manner under any of the following conditions:

(1) The motor rating is less than or equal to 2 horsepower or greater than or equal to 125 horsepower

(2) The motor locked-rotor current is reduced relative to that associated with full voltage, across-the line starting by any of the following means:

a. The motor is started with an adjustable speed drive.

b. The motor is started with a reduced voltage motor controller.

c. Starting on wye connection and running on delta connection is utilized.

(3) The allowable current computed with the following formula is greater than or equal to the locked-rotor current in Table 430.251(C) for the corresponding motor horsepower and voltage rating:

$$I = \left[\frac{A}{\sqrt{t}} \right] \times \sqrt{c \times \log \left(\frac{T_2 + k}{T_1 + k} \right)} = \left[\frac{A}{\sqrt{t}} \right] \times F_c$$

where:

I = allowable short circuit current (Amperes)

A = conductor area in circular mils as determined per Table 8 in Chapter 9

t = time duration of 5 seconds

c = 0.0297 for copper conductors or 0.0125 for aluminum conductors

T₁ = rated maximum operating temperature of the conductor (°C)

T₂ = maximum short-circuit temperature of the conductor, 150°C for thermoplastic insulated conductors or 200°C for thermoset insulated conductors

k = 234 for copper conductors or 228 for aluminum conductors

F_c = conductor short circuit factor which has a numerical value found in Table 430.22(H).

Table: 430.22(H), Conductor Short Circuit Factors (F_c)

<u>F_c</u>	<u>Conductor</u>	<u>T₁</u>	<u>T₂</u>
<u>.0662</u>	<u>copper thermoset insulated conductors</u>	<u>75°C</u>	<u>200°C</u>
<u>.0614</u>	<u>copper thermoset insulated conductors</u>	<u>90°C</u>	<u>200°C</u>
<u>.0587</u>	<u>copper thermoplastic insulated conductors</u>	<u>60°C</u>	<u>150°C</u>
<u>.0529</u>	<u>copper thermoplastic insulated conductors</u>	<u>75°C</u>	<u>150°C</u>
<u>.0468</u>	<u>copper thermoplastic insulated conductors</u>	<u>90°C</u>	<u>150°C</u>
<u>.0433</u>	<u>aluminum thermoset insulated conductors</u>	<u>75°C</u>	<u>200°C</u>
<u>.0402</u>	<u>aluminum thermoset insulated conductors</u>	<u>90°C</u>	<u>200°C</u>

[.0384](#) [aluminum thermoplastic insulated conductors](#) [60°C](#) [150°C](#)

[.0346](#) [aluminum thermoplastic insulated conductors](#) [75°C](#) [150°C](#)

[.0306](#) [aluminum thermoplastic insulated conductors](#) [90°C](#) [150°C](#)

Informational Note: In some cases, satisfying 430.22(H)(3) requires the size of the conductors supplying a Design BE or CE motor to be larger than would otherwise be required.

Supplemental Information

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Committee Statement

Committee Statement: This requirement will provide an adequate level of safety for the protection of conductors for these motor designs. Language changes were made to clarify the references to short circuit current temperatures.

Response Message: SR-8012-NFPA 70-2024

[Public Comment No. 1262-NFPA 70-2024 \[Section No. 430.22\]](#)



Second Revision No. 8015-NFPA 70-2024 [Section No. 430.24]

430.24 Several Motors or a Motor(s) and Other Load(s).

Conductors supplying several motors, or a motor(s) and other load(s), shall have an ampacity not less than the sum of each of the following:

- (1) 125 percent of the full-load current rating of the highest rated motor, as determined by 430.6(A)
- (2) Sum of the full-load current ratings of all the other motors in the group, as determined by 430.6(A)
- (3) 100 percent of the noncontinuous non-motor load
- (4) 125 percent of the continuous non-motor load.

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

Exception No. 1: Where one or more of the motors of the group are used for short-time, intermittent, periodic, or varying duty, the ampere rating of such motors to be used in the summation shall be determined in accordance with 430.22(E). For the highest rated motor, the greater of either the ampere rating from 430.22(E) or the largest continuous duty motor full-load current multiplied by 1.25 shall be used in the summation.

Exception No. 2: The ampacity of conductors supplying motor-operated fixed electric space-heating equipment shall comply with 424.4(B).

Exception No. 3: Where the circuitry is interlocked so as to prevent simultaneous operation of selected motors or other loads, the conductor ampacity shall be permitted to be based on the summation of the currents of the motors and other loads to be operated simultaneously that results in the highest total current.

Exception No. 4: Where one or more of the motors of the group are Design BE or CE motors the conductors supplying the group shall have an ampacity not less than the sum of each of 430.24(1) through 430.24(4). Additionally, the sizing of any thermoplastic insulated or thermoset insulated copper or aluminum conductors with a temperature rating of 90°C (194°F) or less supplying the group shall limit the temperature of the conductors to a value not exceeding their maximum short-circuit temperature when locked-rotor current for any Design BE or CE motors not subject to any of the conditions in 430.22(H)(1) or 430.22(H)(2) is drawn for a time duration of 5 seconds with the conductors initially at their rated maximum operating temperature. The determination that the conductor temperature is limited in this manner shall be according to the method this determination is made for a single Design BE or CE motor in 430.22(H) with the exception that the locked-rotor current shall be the sum of the current values from Table 430.251(C) for the horsepower and voltage rating(s) corresponding to all the Design BE or CE motors not subject to any of the conditions in 430.22(H)(1) or 430.22(H)(2) which can be started simultaneously. In cases where there are Design BE or CE motors not subject to any of the conditions in 430.22(H)(1) or 430.22(H)(2) which cannot be started simultaneously and multiple locked-rotor current values are obtained, the largest value obtained shall be used.

Informational Note: In some cases, the requirements in Exception No. 4 related to limiting conductor temperature when locked-rotor current is drawn for a time duration of 5 seconds result in the required size of the supply conductors being larger than would otherwise be required.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 13:43:18 EDT 2024

Committee Statement

Committee Statement: This requirement will provide an adequate level of safety for the protection of conductors for these motor designs. Editorial changes were made as requested by the submitter.

Response Message: SR-8015-NFPA 70-2024

[Public Comment No. 1263-NFPA 70-2024 \[Section No. 430.24\]](#)



Second Revision No. 8060-NFPA 70-2024 [Section No. 430.72(A)]

(A) General.

A motor control circuit tapped from the load side of a motor branch-circuit short-circuit and ground-fault protective device(s) and functioning to control the motor(s) connected to that branch circuit shall be protected against overcurrent in accordance with 430.72. Such a tapped control circuit shall not be considered to be a branch circuit and shall be permitted to be protected by either a supplementary or branch-circuit overcurrent protective device(s). A motor control circuit other than such a tapped control circuit shall be protected against overcurrent in accordance with 206.4(D), 724.43 or the notes to Table 11(A) and Table 11(B) in Chapter 9, as applicable.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 18:27:23 EDT 2024

Committee Statement

Committee Statement: Provided a pointer to the proper section for non-power limited remote control and signaling circuits overcurrent protection.

This is related to Global PC-542 assigned to CMP-3 but referred to CMP-11 for review.

Response Message: SR-8060-NFPA 70-2024



Second Revision No. 8082-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 and Article 720, Part II . Where the transformer supplies a Class 2 or Class 3 remote-control circuit, the circuit shall comply with the requirements of Article 240, Part II.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Sat Oct 19 11:25:39 EDT 2024

Committee Statement

Committee Statement: Provided a pointer to the proper section for non-power limited remote control and signaling circuits overcurrent protection.

This is related to Global PC-542 assigned to CMP-3 but referred to CMP-11 for review.

Response Message: SR-8082-NFPA 70-2024



Second Revision No. 8056-NFPA 70-2024 [New Section after 430.94]

430.95 Service Equipment.

(A) Disconnecting Means.

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: A second service disconnect shall be permitted to supply additional equipment.

(B) Bonding and Grounding.

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: Impedance grounded systems shall be permitted to be connected as provided in 250.36.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 17:51:57 EDT 2024

Committee Statement

Committee Statement: Returning 430.95 to the 2023 NEC language prevents the unintended consequences created by its deletion.

The term “high-impedance grounded neutral” was changed to “impedance grounded” for consistency with 250.36.

Response Message: SR-8056-NFPA 70-2024

Public Comment No. 697-NFPA 70-2024 [Global Input]



Second Revision No. 8020-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~~ Where supplied by a feeder(s), motor control centers shall be ~~permanently~~ marked in accordance with ~~the following:~~ With the 110.21(B) with the identification and location(s) of the means necessary to disconnect all power to the motor control center

- ~~• With a label that is permanently affixed and of sufficient durability to withstand the environment involved~~
- ~~• Using a method that is not handwritten~~

;

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 14:16:57 EDT 2024

Committee Statement

Committee Statement: Change “when” to “where” and make changes to clarify wording to meet NEC style manual section 4.1.1. Items (2) and (3) on the list were replaced with a reference to 110.21(B) to avoid redundant language within the code.

Response Message: SR-8020-NFPA 70-2024

[Public Comment No. 388-NFPA 70-2024 \[Section No. 430.98\(A\)\]](#)

[Public Comment No. 2044-NFPA 70-2024 \[Section No. 430.98\(A\)\]](#)



Second Revision No. 8021-NFPA 70-2024 [Section No. 430.99]

430.99 Short-Circuit Rating.

(A) Installation.

Motor control centers shall ~~not be installed where have a short-circuit current rating not less than~~ 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.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 14:20:08 EDT 2024

Committee Statement

Committee Statement: Change made to the section to increase the clarity and readability of the section.

Response Message: SR-8021-NFPA 70-2024

Public Comment No. 390-NFPA 70-2024 [Section No. 430.99]



Second Revision No. 8089-NFPA 70-2024 [Section No. 430.110(C)(1)]

(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), Table 430.251(B), or Table 430.251(A 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*

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

where:

kVA/hp = maximum range value of kilovolt-amperes per horsepower with locked rotor in 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:

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

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

Submission Date: Sat Oct 19 12:59:07 EDT 2024

Committee Statement

Committee Statement: Change makes a correction to the table needed to be referenced.

Response Message: SR-8089-NFPA 70-2024

Public Comment No. 753-NFPA 70-2024 [Section No. 430.110(C)(1)]



Second Revision No. 8024-NFPA 70-2024 [Section No. 430.122(B)(2)]

(2) Suitable for Output Motor Conductor Protection.

~~When~~ Where power conversion equipment is listed and marked as “Suitable for Output Motor Conductor Protection,” the 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 430.6(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.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 14:33:20 EDT 2024

Committee Statement

Committee Statement: Change from “when” to “where” to comply with the NEC style manual.

Response Message: SR-8024-NFPA 70-2024

[Public Comment No. 1843-NFPA 70-2024 \[Section No. 430.122\(B\)\(2\)\]](#)

[Public Comment No. 391-NFPA 70-2024 \[Section No. 430.122\]](#)



Second Revision No. 8030-NFPA 70-2024 [Section No. 430.205 [Excluding any Sub-Sections]]

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

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 16:18:43 EDT 2024

Committee Statement

Committee Statement: Changes made to correct the language in the section.

Response Message: SR-8030-NFPA 70-2024

[Public Comment No. 270-NFPA 70-2024 \[Section No. 430.205 \[Excluding any Sub-Sections\]\]](#)



Second Revision No. 8031-NFPA 70-2024 [Section No. 430.208]

430.208 Disconnecting Means.

Disconnecting means in motor circuits over 1000 Volts AC, 1500 V dc, shall comply with 430.208(A) through 430.208(E). The requirements for disconnecting means in Part IX of this Article are applicable only as referenced in 430.208(A) and 430.208(B).

(A) Motor and Motor Controller Disconnecting Means.

The disconnecting means for a motor or motor controller shall comply with 430.102 and shall be lockable in accordance with 110.25.

(B) Disconnecting Means In Motor Circuits.

All disconnecting means

shall be a switch or circuit breaker having a in motor circuits shall comply with 430.102, 430.103, 430.104, 430.105, 430.107, 430.112, and 430.113.

(C) Voltage Rating.

All disconnecting means in motor circuits shall have a voltage rating not less than that of the circuit involved

, and shall be lockable open in accordance with 110.25. The disconnecting means

.

(D) Device Type.

All disconnecting means in motor circuits shall be one of the following devices:

(1) A switch with make and break current ratings no less than the full load current of the circuit involved.

(2) An isolating switch, in series with a contactor or circuit breaker, that is interlocked with a contactor or circuit breaker such that the contactor or breaker must be in the open position before the isolating switch is opened or closed.

(3) A draw-out-type contactor or circuit breaker, interlocked such that it must be in the open position before it can be moved out of or into the connected position.

(E) Current Rating.

All disconnecting means in motor circuits shall have a current rating of not less than

100 percent of the full-load current rating of the motor. For the overload trip current setting of the overcurrent (overload) relays or other motor-protective devices used.

Exception to (E): For adjustable-speed drive systems, the disconnecting means on the line side of the adjustable-speed drive shall have a current rating not less than

100 percent

100 percent of the rated maximum input current of the power conversion equipment, regardless of the current setting of motor protective devices.

Informational Note: Where a disconnecting means is included as part of a listed motor controller, the current rating of the disconnecting means has been determined to be acceptable as part of the controller listing.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 16:21:20 EDT 2024

Committee Statement

Committee Statement: One change is added to include motor disconnect requirements in 430.102 to improve the accuracy of the changes.

Response Message: SR-8031-NFPA 70-2024

[Public Comment No. 832-NFPA 70-2024 \[Section No. 430.208\]](#)



Second Revision No. 8049-NFPA 70-2024 [Section No. 430.251(C)]

[See attached Word file for revisions to Table 430.251 (C).]

(C) Polyphase Design BE and Design CE Maximum Locked-Rotor Currents.

Table 430.251(C) shall provide conversions for polyphase Design BE and Design CE maximum locked-rotor currents for selection of disconnecting means and controllers.

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

Maximum Motor Locked-Rotor Current in Amperes, Two- and Three-Phase, Design BE and Design 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>
½	41.2	23.7	22.8	20.6	10.3	8.2
¾	53.3	30.7	29.5	26.7	13.3	10.7
1	63.6	36.6	35.2	31.8	15.9	12.7
1½	84.2	48.4	46.6	42.1	21.1	16.8
2	112	64.6	62.1	56.2	28.1	22.5
3	—	96.9	93.1	84.2	42.1	33.7
5	—	161	155	140	70.2	56.2
7½	—	242	233	211	105	84.2
10	—	301	290	262	131	105
15	—	452	435	393	197	157
20	—	603	580	524	262	210
25	—	753	724	655	328	262
30	—	904	869	786	393	314
40	—	1119	1076	973	487	389
50	—	1399	1345	1217	608	487
60	—	1679	1614	1460	730	584
75	—	2099	2018	1825	913	730
100	—	2583	2484	2246	1123	898
125	—	3229	3105	2808	1404	1123
150	—	3875	3726	3369	1685	1348
200	—	5166	4968	4492	2246	1797
250	—	—	—	—	2808	2246
300	—	—	—	—	3369	2695
350	—	—	—	—	3931	3145
400	—	—	—	—	4492	3594
450	—	—	—	—	5054	4043
500	—	—	—	—	5616	4492

Note: This table is for use only with 430.110, 440.12, 440.41, and 455.8(C).

Informational Note: Values in Table 430.251(C) should be carefully considered when replacing Design B, C, or D motors with Design BE or Design 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, might not have been evaluated to these higher locked rotor current values.

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_CMP11_430.251_C_SR8049.docx		

Submitter Information Verification

Committee: NEC-P11
Submittal Date: Fri Oct 18 17:36:39 EDT 2024

Committee Statement

Committee Statement: Table was updated based on the locked rotor currents that are to be published in the next edition of ANSI/NEMA MG 00001.
Response Message: SR-8049-NFPA 70-2024

[Public Comment No. 1363-NFPA 70-2024 \[Section No. 430.251\(C\)\]](#)

[Public Comment No. 1362-NFPA 70-2024 \[Section No. 430.251\(C\)\]](#)

(C) Polyphase Design BE and Design CE Maximum Locked-Rotor Currents.

Table 430.251(C) shall provide conversions for polyphase Design BE and Design CE maximum locked-rotor currents for selection of disconnecting means and controllers.

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

Maximum Motor Locked-Rotor Current in Amperes, Two- and Three-Phase, Design BE and Design CE						
Rated Horsepower	115 Volts BE, CE	200 Volts BE, CE	208 Volts BE, CE	230 Volts BE, CE	460 Volts BE, CE	575 Volts BE, CE
1/2	41.2 <u>40.9</u>	23.75	22.86	20.64	10.32	8.2
3/4	53.3 <u>52.5</u>	30.72	29.50	26.72	13.31	10.75
1	63.6	36.6	35.2	31.8	15.9	12.7
1 1/2	84.2 <u>82.8</u>	48.4 <u>47.6</u>	46.6 <u>45.8</u>	42.1 <u>41.4</u>	21.1 <u>20.7</u>	16.86
2	112	64.6	62.1	56.2	28.1	22.5
3	—	96.9 <u>95.3</u>	93.1 <u>91.6</u>	84.2 <u>82.8</u>	42.1 <u>41.4</u>	33.71
5	—	161.1 <u>160</u>	155.1 <u>154</u>	140.1 <u>139</u>	70.2 <u>69.7</u>	56.255.7
7 1/2	—	242.2 <u>238</u>	233.2 <u>229</u>	211.2 <u>207</u>	105.1 <u>104</u>	84.282.8
10	—	301	290	262	131	105
15	—	452.4 <u>445</u>	435.4 <u>427</u>	393.3 <u>387</u>	197.1 <u>193</u>	157.155
20	—	603	580	524	262	210
25	—	753.7 <u>748</u>	724.7 <u>719</u>	655.6 <u>650</u>	328.3 <u>325</u>	262.260
30	—	904.8 <u>889</u>	869.8 <u>855</u>	786.7 <u>773</u>	393.3 <u>387</u>	314.309
40	—	1119	1076	973	487	389
50	—	1399.1 <u>1389</u>	1345.1 <u>1335</u>	1217.1 <u>1207</u>	608.6 <u>604</u>	487.483
60	—	1679	1614	1460	730	584
75	—	2099.2 <u>2064</u>	2018.1 <u>1985</u>	1825.1 <u>1795</u>	913.8 <u>897</u>	730.718
100	—	2583	2484	2246	1123	898
125	—	3229.3 <u>3118</u>	3105.2 <u>2998</u>	2808.2 <u>2711</u>	1404.1 <u>1356</u>	1123.1084
150	—	3875.3 <u>3811</u>	3726.3 <u>3664</u>	3369.3 <u>3313</u>	1685.1 <u>1657</u>	1348.1325
200	—	5166	4968	4492	2246	1797
250	—	—	—	—	2808.2 <u>2786</u>	2246.2229
300	—	—	—	—	3369.3 <u>3313</u>	2695.2651
350	—	—	—	—	3931.3 <u>3765</u>	3145.3012
400	—	—	—	—	4492	3594
450	—	—	—	—	5054.5 <u>5046</u>	4043.4036
500	—	—	—	—	5616	4492

Note: This table is for use only with 430.110, 440.12, 440.41, and 455.8(C).

Informational Note: Values in Table 430.251(C) should be carefully considered when replacing Design B, C, or D motors with Design BE or Design 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, might not have been evaluated to these higher locked rotor current values.



Second Revision No. 8070-NFPA 70-2024 [New Section after 440.1]

440.2 Listing Requirements.

(A) Listing Required.

Factory-assembled electric motor-driven air-conditioning and refrigerating equipment shall be listed.

(B) Field Installed Electric Heaters.

Electric heaters field installed within the enclosure of listed electric motor-driven air-conditioning equipment shall be identified as a listed field installable accessory as part of the listed equipment.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 19:11:31 EDT 2024

Committee Statement

Committee Statement: Listing requirements are added to Article 440 to clarify that factory assembled HVAC equipment and field installed electric heaters shall be listed.

Response Message: SR-8070-NFPA 70-2024

Public Comment No. 1828-NFPA 70-2024 [New Section after 440.1]



Second Revision No. 8073-NFPA 70-2024 [Section No. 440.4]

[See attached Word file for revisions to 440.4]

440.4 Marking on Hermetic Refrigerant Motor-Compressors and Equipment.

(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 440.52(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 440.52(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 440.52(B)(4) is specified, the equipment nameplate shall be appropriately marked.

(B) Multimotor and Combination-Load Equipment.

Multimotor and combination-load equipment shall be provided with a visible nameplate marked with the maker's name, the rating in volts, frequency and number of phases, minimum supply circuit conductor ampacity, the maximum rating of the branch-circuit short-circuit and ground-fault protective device, and the short-circuit current rating of the motor controllers or industrial control panel. The ampacity shall be calculated by using Part IV and counting all the motors and other loads that will be operated at the same time. The branch-circuit short-circuit and ground-fault protective device rating shall not exceed the value calculated by using Part III. Multimotor or combination-load equipment for use on two or more circuits shall be marked with the above information for each circuit.

Exception No. 1: Multimotor and combination-load equipment that is suitable under the provisions of this article for connection to a single 15- or 20-ampere, 120-volt, or a 15-ampere, 208- or 240-volt, single-phase branch circuit shall be permitted to be marked as a single load.

Exception No. 2: The minimum supply circuit conductor ampacity and the maximum rating of the branch-circuit short-circuit and ground-fault protective device shall not be required to be marked on a room air conditioner complying with 440.62(A).

Exception No. 3: Multimotor and combination-load equipment used in one- and two-family dwellings or cord-and-attachment-plug-connected equipment shall not be required to be marked with a short-circuit current rating.

(C) Branch-Circuit Selection Current.

A hermetic refrigerant motor-compressor, or equipment containing such a compressor, having a protection system that is approved for use with the motor-compressor that it protects and that permits continuous current in excess of the specified percentage of nameplate rated-load current given in 440.52(B)(2) or 440.52(B)(4) shall also be marked with a branch-circuit selection current that complies with 440.52(B)(2) or 440.52(B)(4). This marking shall be provided by the equipment manufacturer and shall be on the nameplate(s) where the rated-load current(s) appears.

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_CMP11_440.4_SR8073.docx		
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Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 19:27:36 EDT 2024

Committee Statement

Committee Statement: The requirement for the nameplate to be visible is changed to accessible as the defined term accessible will ensure that the nameplate can be found after installation. Also, 440.4 is re-formatted into lists in order to increase clarity and usability. The term “suitable” is changed to “permitted” in exception 1 to 440.4(B) as “permitted” is more appropriate. The second requirement for the marking for protective systems is deleted as it is redundant to the first requirement for marking for protective systems.

Response Message: SR-8073-NFPA 70-2024

[Public Comment No. 392-NFPA 70-2024 \[Section No. 440.4\]](#)

440.4 Marking on Hermetic Refrigerant Motor-Compressors and Equipment.

(A) Hermetic Refrigerant Motor-Compressor Nameplate.

(1) General. A hermetic refrigerant motor-compressor shall be marked with all of the following: ~~be provided with a visible nameplate that shall indicate~~

(1) The manufacturer's name, trademark, or symbol;

(2) Identifying designation;

(3) Rated number of phases;

(4) Rated voltage; ~~and~~

(5) Rated frequency.

(2) Rated-Load Current. The rated-load current in amperes of the motor-compressor shall be marked on one of the following: ~~by the equipment manufacturer on either or both~~

(1) The motor-compressor nameplate ~~and~~

(2) The nameplate of the equipment in which the motor-compressor is used.

(3) Locked-Rotor Current. The locked-rotor current shall be marked on the motor-compressor nameplate for all of the following: ~~of each~~

(1) Single-phase motor-compressor having a rated-load current of more than 9 amperes at 115 volts; ~~or~~

(2) Single-phase motor compressor having a rated-load current of more than 4.5 amperes at 230 volts; ~~and each~~

(3) Polyphase motor-compressor ~~shall be marked on the motor-compressor nameplate.~~

(4) Thermal Protector. Where a thermal protector complying with 440.52(A)(2) and 440.52(B)(2) is used, the motor-compressor nameplate or the equipment nameplate shall be marked with the words "thermally protected."

(5) Protective System. Where a protective system complying with 440.52(A)(4) and 440.52(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 440.52(B)(4) is specified, the equipment nameplate shall be appropriately marked.~~

(6) Accessible. Multimotor and combination-load equipment nameplates shall be accessible after the installation.

(B) Multimotor and Combination-Load Equipment.

(1) General. Multimotor and combination-load equipment shall be marked with all of the following: ~~provided with a visible nameplate marked with the~~

(1) Manufacturer's name, trademark or symbol

(2) the rating in volts; Rated voltage

(3) Rated frequency ~~and~~

(4) Rated number of phases;

(5) Minimum supply circuit conductor ampacity; ~~the~~

(6) Maximum rating of the branch-circuit short-circuit and ground-fault protective device; ~~and the~~

(7) Short-circuit current rating of the motor controllers or industrial control panel.

(2) Ampacity. The ampacity shall be calculated by using Part IV and counting all the motors and other loads that will be operated at the same time.

(3) Branch-Circuit Short-Circuit and Ground-Fault Protection. The branch-circuit short-circuit and ground-fault protective device rating shall not exceed the value calculated by using Part III.

(4) Multimotor or Combination-Loads. Multimotor or combination-load equipment for use on two or more circuits shall be marked with the above information for each circuit.

(5) Accessible. Multimotor and combination-load equipment nameplates shall be accessible after the installation.

Exception No. 1: Multimotor and combination-load equipment that is ~~suitable-permitted~~ under the provisions of this article for connection to a single 15- or 20-ampere, 120-volt, or a 15-ampere, 208- or 240-volt, single-phase branch circuit shall be permitted to be marked as a single load.

Exception No. 2: The minimum supply circuit conductor ampacity and the maximum rating of the branch-circuit short-circuit and ground-fault protective device shall not be required to be marked on a room air conditioner complying with 440.62(A).

Exception No. 3: Multimotor and combination-load equipment used in one- and two-family dwellings or cord-and-attachment-plug-connected equipment shall not be required to be marked with a short-circuit current rating.

(C) Branch-Circuit Selection Current.

A hermetic refrigerant motor-compressor, or equipment containing such a compressor, having a protection system that is approved for use with the motor-compressor that it protects and that permits continuous current in excess of the specified percentage of nameplate rated-load current given in 440.52(B)(2) or 440.52(B)(4) shall also be marked with a branch-circuit selection current that complies with 440.52(B)(2) or 440.52(B)(4). This marking shall be provided by the equipment manufacturer and shall be on the nameplate(s) where the rated-load current(s) appears.



Second Revision No. 8074-NFPA 70-2024 [Section No. 440.11]

440.11 General.

~~Disconnecting~~ A disconnecting means shall be ~~capable of disconnecting~~ provided to disconnect 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 be opened.

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 19:35:07 EDT 2024

Committee Statement

Committee Statement: Response for PC-1763: The first sentence of 440.11 is revised for clarity. The second sentence will remain because there are requirements in the second sentence not found in 404.30. Section 404.30 is limited to disconnects that are in the closed position. Section 440.11 is for disconnects in both the open and closed positions.

Response for PC-758: The wording “ , from the circuit conductors.” is removed from 440.11 since it is redundant to the Article 100 definition of disconnecting means.

Response Message: SR-8074-NFPA 70-2024

[Public Comment No. 758-NFPA 70-2024 \[Section No. 440.11\]](#)

[Public Comment No. 1763-NFPA 70-2024 \[Section No. 440.11\]](#)



Second Revision No. 8076-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), Table 430.251(B), or Table 430.251(A 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), 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

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Committee Statement

Committee Statement: The second reference to Table 430.251(A) is corrected to Table 430.251(C).

Response Message: SR-8076-NFPA 70-2024

Public Comment No. 759-NFPA 70-2024 [Section No. 440.12(A)(2)]



Second Revision No. 8079-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.

Exception No. 3: Residential non-fused single-phase disconnecting means rated 250 volt or less and not exceeding 60 amperes shall be in sight from the equipment and accessible.

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

Submitter Information Verification

Committee: NEC-P11

Submittal Date: Fri Oct 18 20:11:58 EDT 2024

Committee Statement

Committee Statement: Non-fusible disconnect switches rated 250 V single phase and 60 A (or less) are allowed to be located in sight from the equipment, as opposed to readily accessible and within sight. These switches do not require the same level of work for maintenance and operation as fusible switches and those with higher ratings.

Response Message: SR-8079-NFPA 70-2024

Public Comment No. 1352-NFPA 70-2024 [Section No. 440.14]



Second Revision No. 8080-NFPA 70-2024 [Section No. 440.15]

440.15 Split-System Disconnect Indoor Unit Identification.

~~In Outdoor disconnecting means for a split-system HVAC, in other than one- and two- family dwellings, in addition to the requirements of shall be marked with the location of all indoor units that it supplies and be in accordance with 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. _~~

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: NEC-P11

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Committee Statement

Committee Statement: The title is revised to more accurately reflect the requirements. The requirements are rewritten for clarity.

Response Message: SR-8080-NFPA 70-2024

Public Comment No. 395-NFPA 70-2024 [Section No. 440.15]