Second Revision No. 7929-NFPA 70-2018 [Global Comment]

725.2 Definitions

The definitions in this section shall apply only within this article.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 16:31:57 EDT 2018

Committee Statement

Committee Statement: The revised language is part of a global effort to provide guidance to the user of the code regarding applicability of definitions located in the .2 sections within individual articles. The added text to the introduction in 725.2 makes it clear that the definition is not limited to Article 725.

Response Message: SR-7929-NFPA 70-2018

Public Comment No. 1181-NFPA 70-2018 [Section No. 725.2]

Public Comment No. 2116-NFPA 70-2018 [Section No. 725.2]

Second Revision No. 7849-NFPA 70-2018 [Section No. 300.3(B)(1)]

(1) Paralleled Installations.

Conductors shall be permitted to be run in parallel in accordance with the provisions of 310.10(G). The requirement to run all circuit conductors within the same raceway, auxiliary gutter, cable tray, trench, cable, or cord shall apply separately to each portion of the paralleled installation, and the equipment grounding conductors shall comply with ~~the provisions of~~ 250.122. Connections, taps, or extensions made from paralleled conductors shall connect to all conductors of the paralleled set, grounded and ungrounded, as applicable. Parallel runs in cable trays shall comply with ~~the requirements of~~ 392.20(C).

Exception: Conductors installed in nonmetallic raceways run underground shall be permitted to be arranged as isolated phase, neutral, and grounded conductor installations. The raceways shall be installed in close proximity, and the isolated phase, neutral, and grounded conductors shall comply with ~~the provisions of~~ 300.20(B).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 11:25:50 EDT 2018

Committee Statement

Committee Statement: The text has been modified to make it totally clear that the connection to a paralleled set of conductors must be to all of the conductors of the set and not just to one of the conductors in parallel as has been done in the past. The phrases “the requirements of” and “the provisions of” have been deleted since these phrases are unnecessary for compliance with these references.

Response Message: SR-7849-NFPA 70-2018

Public Comment No. 280-NFPA 70-2018 [Section No. 300.3(B)(1)]

Public Comment No. 225-NFPA 70-2018 [Section No. 300.3(B)(1)]

Public Comment No. 645-NFPA 70-2018 [Section No. 300.3(B)(1)]

Second Revision No. 7853-NFPA 70-2018 [Section No. 300.3(B)(3)]

(3) Nonferrous Wiring Methods.

Conductors in wiring methods with a nonmetallic or other nonmagnetic sheath, where run in different raceways, auxiliary gutters, cable trays, trenches, cables, or cords, shall comply with ~~the provisions of~~ 300.20(B). Conductors in single-conductor Type MI cable with a nonmagnetic sheath shall comply with ~~the provisions of~~ 332.31. Conductors of single-conductor Type MC cable with a nonmagnetic sheath shall comply with ~~the provisions of~~ 330.31, 330.116, and 300.20(B).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 11:30:22 EDT 2018

Committee Statement

Committee Statement: The phrase “the provisions of” has been deleted in multiple places since this phrase is unnecessary for compliance with these references.

Response Message: SR-7853-NFPA 70-2018

Public Comment No. 650-NFPA 70-2018 [Section No. 300.3(B)(3)]

Second Revision No. 7865-NFPA 70-2018 [Section No. 300.4(G)]

(G) Fittings.

Where raceways contain 4 AWG or larger insulated circuit conductors, and these conductors enter a cabinet, a box, an enclosure, or a raceway, the conductors shall be protected ~~or a listed metal fitting that has smoothly rounded edges, unless the conductors are separated from the fitting or raceway by identified insulating material that is securely fastened in place.~~ in accordance with any of the following:

(1) ~~by an~~ An identified fitting providing a smoothly rounded insulating surface

(2) ~~a~~ A listed metal fitting that has smoothly rounded edges

(3) Separation from the fitting or raceway ~~by~~ using an identified insulating material that is securely fastened in place

(4) Threaded hubs or bosses that are an integral part of a cabinet, box, enclosure, or raceway provide a smoothly rounded or flared entry for conductors~~.~~

~~*Exception: Where threaded hubs or bosses that are an integral part of a cabinet, box, enclosure, or raceway provide a smoothly rounded or flared entry for conductors.*~~

Conduit bushings constructed wholly of insulating material shall not be used to secure a fitting or raceway. The insulating fitting or insulating material shall have a temperature rating not less than the insulation temperature rating of the installed conductors.

Supplemental Information

File Name	Description	Approved
70_SR7865_300.4_G_.docx	FOR STAFF USE	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 11:46:36 EDT 2018

Committee Statement

Committee Statement: Section 300.4(G) was converted to a numbered list for clarity. The exception was deleted and rewritten as positive text.

Response Message: SR-7865-NFPA 70-2018

Public Comment No. 903-NFPA 70-2018 [Section No. 300.4(G)]

Second Revision No. 7882-NFPA 70-2018 [Section No. 300.11(B)(1)]

(1) Fire-Rated Assemblies.

Wiring located within the cavity of a fire-rated floor–ceiling or roof–ceiling assembly shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent means of secure support shall be provided and shall be permitted to be attached to the assembly. Where independent support wires are used, they shall be distinguishable by color, tagging, or other effective means from those that are part of the fire-rated design.

Exception: The ceiling support system shall be permitted to support wiring and equipment that have been tested as part of the fire-rated assembly.

Informational Note: One method of determining fire rating is testing in accordance with ANSI/ASTM E119-~~16a~~ 18b , *Standard Test Methods for Fire Tests of Building Construction and Materials*.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 12:42:30 EDT 2018

Committee Statement

Committee Statement: The informational note has been updated to reflect the latest active version of ANSI/ASTM E119-18b.

Response Message: SR-7882-NFPA 70-2018

Public Comment No. 519-NFPA 70-2018 [Section No. 300.11(B)(1)]

Second Revision No. 7886-NFPA 70-2018 [Section No. 300.15(F)]

(F) Fitting.

A fitting identified for the use shall be permitted in lieu of a box or conduit body where conductors are not spliced or terminated within the fitting. The fitting shall be accessible after installation, unless listed for concealed installation. ~~or listed interconnector devices as provided in 344.40(B).~~

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 13:01:48 EDT 2018

Committee Statement

Committee Statement: Interconnector devices connect cable to cable (a splice) without the use of an enclosure. Interconnector devices are not fittings they are splicing devices which are designed to interconnect Type NM Cables. It is important to note that these interconnectors are listed in accordance with UL Standard 2256 under product category QAAV, whereas typically conduit and cable fittings (change overs) are listed to UL Standard 514 B and referenced under product category DWTT.

Response Message: SR-7886-NFPA 70-2018

Public Comment No. 386-NFPA 70-2018 [Section No. 300.15(F)]

Public Comment No. 491-NFPA 70-2018 [Section No. 300.15(F)]

Public Comment No. 546-NFPA 70-2018 [Section No. 300.15(F)]

Public Comment No. 1121-NFPA 70-2018 [Section No. 300.15(F)]

Public Comment No. 1334-NFPA 70-2018 [Section No. 300.15(F)]

Public Comment No. 1517-NFPA 70-2018 [Section No. 300.15(F)]

Second Revision No. 7888-NFPA 70-2018 [Section No. 300.25]

300.25 Exit Enclosures (Stair Towers).

Where an exit enclosure is required to be separated from the building, only electrical wiring methods serving ~~electrical~~ equipment permitted by the ~~AHJ~~ authority having jurisdiction in the exit enclosure shall be installed within the exit enclosure.

Informational Note: For more information, refer to NFPA *101*-2018, *Life Safety Code*, 7.1.3.2.1(10)(b).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 13:05:58 EDT 2018

Committee Statement

Committee Statement: The word “methods” was inserted to more accurately describe the electrical wiring permitted to connect to equipment in the exit enclosure. The text accepted in the first revision and these two comments is basically the same as found in NFPA 101, 7.1.3.2.1(10)(b) and A.7.1.3.2.1(10)(b), however, this new text covers not only conduit but will restrict all electrical wiring methods that may enter into the exit enclosure to only wiring within the exit area.

Response Message: SR-7888-NFPA 70-2018

Public Comment No. 508-NFPA 70-2018 [Section No. 300.25]

Public Comment No. 653-NFPA 70-2018 [Section No. 300.25]

Second Revision No. 7894-NFPA 70-2018 [Section No. 590.4(G)]

(G) Splices.

A box, conduit body, or other enclosure, with a cover installed, shall be required for all splices.

Exception No. 1: On construction sites, a box, conduit body, or other enclosure shall not be required for either of the following conditions:

(1) The circuit conductors being spliced are all from nonmetallic multiconductor cord or cable assemblies, provided that the equipment grounding continuity is maintained with or without the box.

(2) The circuit conductors being spliced are all from metal-sheathed cable assemblies terminated in listed fittings that mechanically secure the cable sheath to maintain effective electrical continuity.

Exception No. 2: On construction sites, ~~where~~ branch- circuits that are permanently installed ~~as permanent wiring~~ in framed walls and ceilings and are used to supply temporary power or lighting, ~~a cover shall not be required for splices installed completely inside of junction boxes with plaster rings. Listed pigtail-type lampholders shall be permitted to be installed in ceiling-mounted junction boxes with plaster rings. Finger safe devices for supplying and connection to devices shall also be permitted.~~ and that are GFCI protected, the following shall be permitted:

(1) A box cover shall not be required for splices installed completely inside of junction boxes with plaster rings.

(2) Listed pigtail-type lampholders shall be permitted to be installed in ceiling-mounted junction boxes with plaster rings.

(3) Finger safe devices shall be permitted for supplying and connection ~~to~~ of devices ~~shall also be permitted~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 13:19:19 EDT 2018

Committee Statement

Committee Statement: The panel is adding a requirement that when this permissive language is used on temporary wiring during construction, the circuitry contained in these open enclosures need GFCI protection to guard against shock due to accidental contact.

The exception was restructured to a numbered list for clarity.

Response Message: SR-7894-NFPA 70-2018

Public Comment No. 1117-NFPA 70-2018 [Section No. 590.4(G)]

Public Comment No. 1495-NFPA 70-2018 [Section No. 590.4(G)]

Second Revision No. 7904-NFPA 70-2018 [Section No. 590.6(B)(2)]

(2) Assured Equipment Grounding Conductor Program.

A written assured equipment grounding conductor program continuously enforced at the site by one or more designated persons to ensure that equipment grounding conductors for all cord sets, receptacles that are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug are installed and maintained in accordance with the applicable requirements of 250.114, 250.138, 406.4(C), and 590.4(D).

(a) The following tests shall be performed on all cord sets, receptacles that are not part of the permanent wiring of the building or structure, and cord-and-plug-connected equipment required to be connected to an equipment grounding conductor:

(1) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(2) Each receptacle and attachment plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

(3) All required tests shall be performed as follows:

a. Before first use on site

b. When there is evidence of damage

c. Before equipment is returned to service following any repairs

d. At intervals not exceeding 3 months

(b) The tests required in ~~item~~ 590.6(B)(2)(a) shall be recorded and made available to the authority having jurisdiction.

The assured equipment grounding conductor program shall be documented and made available to the authority having jurisdiction.

Informational Note: The Occupational Safety and Health Administration 29 CFR 1910 and 1926 contain requirements for assured equipment grounding conductor programs. Additional information is provided in NFPA 70E -2018, *Standard for Electrical Safety in the Workplace* .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 14:08:47 EDT 2018

Committee Statement

Committee Statement: Applying the assured equipment grounding conductor program during construction is consistent with the scope of the NEC and should be covered as a temporary method. Complying with grounding and bonding on a temporary basis and a temporary modification of the grounding and bonding requirement is required of Article 250 in Article 590. The last sentence was added to assist the Authority Having Jurisdiction in documenting and controlling this grounding program.

Response Message: SR-7904-NFPA 70-2018

Public Comment No. 1359-NFPA 70-2018 [Section No. 590.6(B)(2)]

Second Revision No. 7919-NFPA 70-2018 [New Section after 590.7]

590.8 Overcurrent Protective Devices.

(A) Where Reused.

Where overcurrent protective devices that have been previously used are installed in a temporary installation, these overcurrent protective devices shall be examined to ensure these devices have been properly installed, properly maintained, and there is no evidence of impending failure.

(B) Service Overcurrent Protective Devices.

Overcurrent protective devices for solidly grounded wye electrical services of more than 150 volts to ground but not exceeding 1000 volts phase-to-phase shall be current limiting.

Informational Note: The phrase “evidence of impending failure” means that there is evidence such as arcing, overheating, loose or bound equipment parts, visible damage, or deterioration. The phrase “properly maintained” means that the equipment has been maintained in accordance with the manufacturers’ recommendations and applicable industry codes and standards. References for manufacturers’ recommendations and applicable industry codes and standards include but are not limited to NEMA AB 4-2017, *Guidelines for Inspection and Preventative Maintenance of Molded-Case Circuit Breakers Used in Commercial and Industrial Applications* ; NFPA 70B -2019, *Recommended Practice for Electrical Equipment Maintenance* ; NEMA GD 1-2016, *Evaluating Water-Damaged Electrical Equipment* ; and IEEE 1458-2017, *IEEE Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded-Case Circuit Breakers for Industrial Applications* .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 15:48:14 EDT 2018

Committee Statement

Committee Statement: Equipment that has been previously installed may have been subjected to environments, uses, and conditions that may not be visibly obvious. Approval of that equipment is difficult in many cases. Section 590.8 was added to provide guidance for AHJ's in the reuse of equipment.

The word “Where” as added to the title of (A) for clarity. The phrase “these overcurrent protective devices shall be examined to ensure these devices…” was revised to remove the pronoun “they” in two places for clarity.

Response Message: SR-7919-NFPA 70-2018

Public Comment No. 1619-NFPA 70-2018 [New Section after 590.7]

Second Revision No. 7923-NFPA 70-2018 [Section No. 720.2]

720.2 Other Articles.

Direct current or alternating-current installations operating at less than 50 volts, as covered in 411.1 through 411.8; Part VI of Article 517; Part II of Article 551; Parts II and III and 552.60(B) of Article 552; 650.1 through 650.9; 669.1 through 669.9; Parts I and VIII of Article 690; Parts I, II, and III of Article 725; or Parts I, II, and III of Article 760, shall not be required to comply with this article.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 16:18:28 EDT 2018

Committee Statement

Committee Statement: Articles 725 and 760 have their own requirements for circuits operating at less than 50 volts in their respective Part II's. This public comment does not take into consideration that Part II of Article 725 deals with power-limited circuits of 30 volts and 1000 VA but also deals with control power circuits up to 600 volts. This same consideration occurs in Part II of Article 760. Article 720 would only apply to less than 50 volt applications.

Response Message: SR-7923-NFPA 70-2018

Public Comment No. 1307-NFPA 70-2018 [Section No. 720.2]

Second Revision No. 7933-NFPA 70-2018 [Definition: Cable Bundle.]

Cable Bundle.

A group of cables that are tied together or in contact with one another in a closely packed configuration for at least 1.0 m (40 in.).

Informational Note: Random or loose installation of individual cables can result in less heating. Combing of the cables can result in less heat dissipation and more signal cross talk between cables.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 16:41:38 EDT 2018

Committee Statement

Committee Statement: The Informational Note indicated that there would be less cross talk which is incorrect. The word “more” was added to correct the Informational Note.

Response Message: SR-7933-NFPA 70-2018

Second Revision No. 7935-NFPA 70-2018 [Definition: Nominal Current.]

~~**Nominal Current.**~~

~~The designated current per conductor as specified by equipment design.~~

~~Informational Note: One example of nominal current is 4-pair Power over Ethernet (PoE) applications based on IEEE Std. 802.3-2015, *IEEE Standard for Ethernet* , that supply current over twisted pairs. The nominal current for 60-watt PoE power sourcing equipment is 0.3 amperes per conductor, where the current in one conductor can be 0.36 amperes and another conductor can be 0.24 amperes.~~

Submitter Information Verification

Committee: NEC-P03
Submittal Date: Mon Oct 29 16:53:34 EDT 2018

Committee Statement

Committee Statement: The definition 'Nominal Current' is no longer used and has been deleted.
Response Message: SR-7935-NFPA 70-2018

Public Comment No. 1191-NFPA 70-2018 [Definition: Nominal Current.]

Public Comment No. 769-NFPA 70-2018 [Definition: Nominal Current.]

Second Revision No. 7936-NFPA 70-2018 [Section No. 725.3(C)]

(C) Ducts, Plenums, and Other Air-Handling Spaces.

Class 1, Class 2, and Class 3 circuits installed in ducts, plenums, or other space used for environmental air shall comply with 300.22.

Exception No. 1: Class 2 and Class 3 cables selected in accordance with Table 725.154 and installed in accordance with 725.135(B) and 300.22(B), Exception shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: Class 2 and Class 3 cables selected in accordance with Table 725.154 and installed in accordance with 725.135(C) shall be permitted to be installed in other spaces used for environmental air (plenums).

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 16:59:23 EDT 2018

Committee Statement

Committee Statement: The reference to the exception of 300.22(B) is correct but could be confusing. Deleting the comma after 300.22(B), will make the reference more clear.

Response Message: SR-7936-NFPA 70-2018

Public Comment No. 172-NFPA 70-2018 [Section No. 725.3(C)]

Second Revision No. 7938-NFPA 70-2018 [Section No. 725.3(D)]

(D) Hazardous (Classified) Locations.

~~Sections~~ Class 1, Class 2, and Class 3 circuits installed in hazardous (classified) locations shall comply with 501.10(B)(1), 501.150, 502.10(B)(1), 502.150, 503.10(A)(1), 503.150, 506.15(A), 506.15(C), 511.7(B)(1), 515.7(A), and Article 517, Part IV~~, where installed in hazardous (classified) locations~~ .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 17:02:40 EDT 2018

Committee Statement

Committee Statement: The language “Class 1, Class 2, and Class 3 circuits installed in hazardous (Classified) locations shall comply with” is added to improve clarity and comply with section 3.3.1 of the NEC Style Manual.

Response Message: SR-7938-NFPA 70-2018

Public Comment No. 1185-NFPA 70-2018 [Section No. 725.3(D)]

Second Revision No. 8032-NFPA 70-2018 [Section No. 725.3(M)]

(M) Cable Routing Assemblies.

Class 2, Class 3, and Type PLTC cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with ~~Table 805.154(c)~~ Table 800.154(c) , listed in accordance with 800.182, and installed in accordance with ~~805.110(C)~~ 800.110(C) and ~~805.113~~ 800.113 .

(N) Communications Raceways.

Class 2, Class 3, and Type PLTC cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with ~~Table 805.154(b)~~ Table 800.154(b) , listed in accordance with 800.182, and installed in accordance with ~~805.113~~ 800.113 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing (ENT) apply.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 30 12:27:49 EDT 2018

Committee Statement

Committee Statement: References to Article 805 have been updated to reflect the sections that have been relocated to Article 800.

Response Message: SR-8032-NFPA 70-2018

Public Comment No. 113-NFPA 70-2018 [Sections 725.3(M), 725.3(N)]

Second Revision No. 7947-NFPA 70-2018 [New Section after 725.3(O)]

(P) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119 .

Exception: Conductors with green insulation shall be permitted to be used as ungrounded signal conductors for Types CL3P, CL2P, CL3R, CL2R, CL3, CL2, CL3X, CL2X, and substitute cables installed in accordance with 725.154(A) .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 17:25:56 EDT 2018

Committee Statement

Committee Statement: Section 725.3(P) has been added to permit certain systems operating at over 50 volts to use green conductors as other than equipment grounding conductors.

Response Message: SR-7947-NFPA 70-2018

Public Comment No. 1936-NFPA 70-2018 [New Section after 725.3(O)]

Second Revision No. 7958-NFPA 70-2018 [Section No. 725.48(B)(1)]

(1) In a Cable, Enclosure, or Raceway.

Class 1 circuits and power-supply circuits shall be permitted to occupy the same cable, enclosure, or raceway without a barrier only where the equipment powered is functionally associated. Class 1 circuits shall be permitted to be installed together with the conductors of electric light, power, non-power-limited fire alarm, and medium power network-powered broadband communications circuits where separated by a barrier.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 17:52:47 EDT 2018

Committee Statement

Committee Statement: The addition of the phrase "with out a barrier" clarifies that there are two independent conditions in the requirement.

Response Message: SR-7958-NFPA 70-2018

Public Comment No. 40-NFPA 70-2018 [Section No. 725.48(B)(1)]

Second Revision No. 7960-NFPA 70-2018 [Section No. 725.121(A)]

(A) Power Source.

The power source for a Class 2 or a Class 3 circuit shall be as follows:

Informational Note No. 1: Informational Note Figure 725.121~~,~~ illustrates the relationships between Class 2 or Class 3 power sources, their supply, and the Class 2 or Class 3 circuits.

Informational Note No. 2: Table 11(A) and Table 11(B) in Chapter 9 provide the requirements for listed Class 2 and Class 3 power sources.

(1) A listed Class 2 or Class 3 transformer

(2) A listed Class 2 or Class 3 power supply

(3) Other listed equipment marked to identify the Class 2 or Class 3 power source

Exception No. 1 to (3): Thermocouples shall not require listing as a Class 2 power source.

Exception No. 2 to (3): Limited power circuits of listed equipment where these circuits have energy levels rated at or below the limits established in Chapter 9, Table 11(A) and Table 11(B).

Informational Note: Examples of other listed equipment are as follows:

(1) A circuit card listed for use as a Class 2 or Class 3 power source where used as part of a listed assembly

(2) A current-limiting impedance, listed for the purpose, or part of a listed product, used in conjunction with a non-power-limited transformer or a stored energy source, for example, storage battery, to limit the output current

(3) A thermocouple

(4) Limited voltage/current or limited impedance secondary communications circuits of listed industrial control equipment

(4) Listed audio/video, information technology (computer), communications, and industrial equipment limited-power circuits

Informational Note: One way to determine applicable requirements for listing of information technology (computer) equipment is to refer to UL 60950-1-2011, *Standard for Safety of Information Technology Equipment*. Another way to determine applicable requirements for listing of audio/video, information technology, and communications equipment is to refer to UL 62368-1-2014, *Safety of audio/video, information and communication technology equipment*. Typically such circuits are used to interconnect data circuits for the purpose of exchanging information data. One way to determine applicable requirements for listing of industrial equipment is to refer to UL 61010-2-201, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-201: Particular requirements for control equipment*, and/or UL 61800-5-1, *Adjustable speed electrical power drive systems — Part 5-1: Safety requirements — Electrical, thermal and energy.*

(5) A ~~listed~~ battery source or battery source system that is listed and identified as Class 2

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 17:58:23 EDT 2018

Committee Statement

Committee Statement: The informational note and corresponding figure have been revised to correctly correlate with one another.

The present text could be construed that any listed battery, regardless of energy level, can be used as a Class 2 source. Re-arranging the sentence clarifies that it must be listed as Class 2.

Response Message: SR-7960-NFPA 70-2018

Public Comment No. 1186-NFPA 70-2018 [Section No. 725.121(A)]

Public Comment No. 1547-NFPA 70-2018 [Section No. 725.121(A)]

Second Revision No. 7967-NFPA 70-2018 [Section No. 725.121(C)]

(C) Marking.

The power sources for limited power circuits in 725.121(A)(3), limited power circuits for listed audio/video equipment, listed information technology equipment, listed communications equipment, and listed industrial equipment in 725.121(A)(4) shall have a label indicating the maximum voltage and ~~maximum current or maximum voltage and nominal~~ rated current output per conductor for each connection point on the power source. Where multiple connection points have the same rating, a single label shall be permitted to be used.

Informational Note: Rated current for power sources covered in 725.144 is the output current per conductor the power source is designed to deliver to an operational load at normal operating conditions, as declared by the manufacturer.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 18:10:17 EDT 2018

Committee Statement

Committee Statement: Replacing the terms “maximum current”, “maximum voltage” and “nominal current” with the term “rated” and the addition of the informational note removes confusion over the deleted terms.

Response Message: SR-7967-NFPA 70-2018

Public Comment No. 1941-NFPA 70-2018 [Section No. 725.121(C)]

Public Comment No. 766-NFPA 70-2018 [Section No. 725.121(C)]

Second Revision No. 7973-NFPA 70-2018 [Section No. 725.144(A)]

(A) Use of Class 2 or Class 3 Cables to Transmit Power and Data.

Where Types CL3P, CL2P, CL3R, CL2R, CL3, or CL2 transmit power and data, the rated current per conductor of the power source shall not exceed the ampacities in Table 725.144~~shall apply to the nominal current~~ at an ambient temperature of 30°C (86°F). For ambient temperatures above 30°C (86°F), the correction factors in Table 310.15(B)(1) or in ~~the equation in~~ Equation 310.15(B) shall apply.

Exception: Compliance with Table 725.144 shall not be required for installations where conductors are 24 AWG or larger and the ~~nominal current~~ rated current per conductor of the power source does not exceed 0.3 amperes ~~in any conductor~~ .

Informational Note: One example of the use of Class 2 cables is a network of closed-circuit TV cameras using 24 AWG, 60°C rated, Type CL2R, Category 5e balanced twisted-pair cabling.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 18:30:17 EDT 2018

Committee Statement

Committee Statement: Clarification is provided by using 'rated current for each conductor of the power source' and replacement of the word 'nominal' with 'rated' along with the added informational note describing that rated current includes the unbalance that was referred to under 'nominal current'. These changes will align the text of 840.160 and 725.144.

Response Message: SR-7973-NFPA 70-2018

Public Comment No. 1946-NFPA 70-2018 [Section No. 725.144(A)]

Public Comment No. 763-NFPA 70-2018 [Section No. 725.144(A)]

Second Revision No. 7975-NFPA 70-2018 [Section No. 725.144(B)]

(B) Use of Class 2-LP or Class 3-LP Cables to Transmit Power and Data.

Types CL3P-LP, CL2P-LP, CL3R-LP, CL2R-LP, CL3-LP, or CL2-LP shall be permitted to supply power to equipment ~~at~~ from a ~~current level~~ power source with a rated current per conductor up to the marked current limit located immediately following the suffix "-LP" and shall be permitted to transmit data to the equipment. Where the number of bundled LP cables is 192 or less and the selected ampacity of the cables in accordance with Table 725.144 exceeds the marked ~~ampacity~~ current limit of the cable, the ampacity determined from the table shall be permitted to be used. For ambient temperatures above 30°C (86°F), the correction factors of Table 310.15(B)(1) or Equation 310.15(B)~~(2)~~ shall apply. The Class 2-LP and Class 3-LP cables shall comply with the following, as applicable:

(1) Cables with the suffix "-LP" shall be permitted to be installed in bundles, raceways, cable trays, communications raceways, and cable routing assemblies.

(2) Cables with the suffix "-LP" and a marked current limit shall follow the substitution hierarchy of Table 725.154 and Figure 725.154(A) for the cable type without the suffix "-LP" and without the marked current limit.

(3) System design shall be permitted by qualified persons under engineering supervision.

Informational Note: An example of a limited power (LP) cable is a cable marked Type CL2-LP(0.5A), 23 AWG.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 18:34:55 EDT 2018

Committee Statement

Committee Statement: The term "ampere limit" was changed to "current limit" because current limit is "the more appropriate terminology". The term "marked ampacity" is changed to "marked current limit" to be consistent with the changes introduced in FR-8934.

Clarification is provided by using ' power source with a rated current for each conductor' along with the added informational note of PC 755 describing that rated current includes the unbalance that was referred to under "nominal current". These changes align the text of 840.160 and 725.144. The informational note was relocated to follow the text to which it applies in accordance with the NEC Style Manual.

Response Message: SR-7975-NFPA 70-2018

Public Comment No. 325-NFPA 70-2018 [Section No. 725.144(B)]

Public Comment No. 765-NFPA 70-2018 [Section No. 725.144(B)]

Second Revision No. 7980-NFPA 70-2018 [Section No. 725.144 [Excluding any Sub-Sections]]

Sections 725.144(A) and (B) shall apply to Class 2 and Class 3 circuits that transmit power and data to a powered device. Section 300.11 and Parts I and III of Article 725 shall apply to Class 2 and Class 3 circuits that transmit power and data. The conductors that carry power for the data circuits shall be copper. The current in the power circuit shall not exceed the current limitation of the connectors.

Informational Note No. 1: One example of the use of cables that transmit power and data is the connection of closed-circuit TV cameras (CCTV).

Informational Note No. 2: The 8P8C connector is in widespread use with powered communications systems. IEC 60603-7-2008, *Connectors for electronic equipment — Part 7-1: Detail specification for 8-way, unshielded, free and fixed connectors,* specifies these connectors to have a current-carrying capacity per contact of 1.0 amperes maximum at 60°C (149°F). See IEC 60603-7 for more information on current-carrying capacity at higher and lower temperatures.

Informational Note No. 3: The requirements of Table 725.144 were derived for carrying power and data over 4-pair copper balanced twisted pair cabling. This type of cabling is described in ANSI/TIA 568-C.2-2009, *Commercial Building Telecommunications Cabling Standard — Part 2: Balanced Twisted-Pair Telecommunications Cabling and Components*.

Informational Note No. 4: See TIA-TSB-184-A-2017, *Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling*, for information on installation and management of balanced twisted pair cabling supporting power delivery.

Informational Note No. 5: See ANSI/NEMA C137.3-2017, *American National Standard for Lighting Systems — Minimum Requirements for Installation of Energy Efficient Power over Ethernet (PoE) Lighting Systems*, for information on installation of cables for PoE lighting systems.

Informational Note No. 6: Rated current for power sources covered in 725.144 is the output current per conductor the power source is designed to deliver to an operational load at normal operating conditions, as declared by the manufacturer. In the design of these systems, the actual current in a given conductor might vary from the rated current per conductor by as much as 20 percent. An increase in current in one conductor is offset by a corresponding decrease in current in one or more conductors of the same cable.

Table 725.144 Ampacities of Each Conductor in Amperes in 4-Pair Class 2 or Class 3 Balanced Twisted-Pair Cables Based on Copper Conductors at an Ambient Temperature of 30°C (86°F) with All Conductors in All Cables Carrying Current, 60°C (140°F), 75°C (167°F), and 90°C (194°F) Rated Cables

AWG		Number of 4-Pair Cables in a Bundle											
		1–7			8–19			20–37			38–61		
		Temperature Rating			Temperature Rating			Temperature Rating			Temperature Rating		
		60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C
26		1.00	1.23	1.42	0.71	0.87	1.02	0.55	0.68	0.78	0.46	0.57	0.67
24		1.19	1.46	1.69	0.81	1.01	1.17	0.63	0.78	0.91	0.55	0.67	0.78
23		1.24	1.53	1.78	0.89	1.11	1.28	~~0.67~~ 0.77	~~0.83~~ 0.95	~~0.97~~ 1.10	~~0.58~~ 0.66	~~0.72~~ 0.80	~~0.83~~ 0.9
22		1.50	1.86	2.16	1.04	1.28	1.49	0.77	0.95	1.11	0.66	0.82	0.96

Note 1: For bundle sizes over 192 cables, or for conductor sizes smaller than 26 AWG, ampacities shall be permitted to be determined by qualified personnel under engineering supervision.

Note 2: Where only half of the conductors in each cable are carrying current, the values in the table shall be permitted to be increased by a factor of 1.4.

Informational Note No. 1: Elevated cable temperatures can reduce a cable's data transmission performance. For information on practices for 4-pair balanced twisted pair cabling, see TIA-TSB-184-A and 6.4.7, 6.6.3, and Annex G of ANSI/TIA-568-C.2, which provide guidance on adjustments for operating temperatures between 20°C and 60°C.

Informational Note No. 2: The per-contact current rating of connectors can limit the maximum allowable current below the ampacity shown in Table 725.144.

Supplemental Information

File Name	Description	Approved
70_7980_T725.144.docx	FOR STAFF USE	

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 18:41:33 EDT 2018

Committee Statement

Committee Statement: The added informational note clarifies rated current in that the current in one conductor may deviate from the rated value, but an increase in one conductors is offset by a corresponding decrease in current in one or more conductors of the same cable. The proposed informational note identifies that rated current includes the unbalance that was referred to under 'nominal current'. These changes align the text of 840.160 and 725.144.

The values have been updated in Table 725.144 to reflect new measurements of 23 AWG cable heating.

Response Message: SR-7980-NFPA 70-2018

Public Comment No. 1903-NFPA 70-2018 [Definition: Nominal Current.]

Public Comment No. 1262-NFPA 70-2018 [Section No. 725.144]

Public Comment No. 1255-NFPA 70-2018 [Section No. 725.144 [Excluding any Sub-Sections]]

Public Comment No. 755-NFPA 70-2018 [Section No. 725.144 [Excluding any Sub-Sections]]

Second Revision No. 7990-NFPA 70-2018 [Section No. 725.179(K)]

(K) Optional Markings.

Cables shall be permitted to be surface marked to indicate special characteristics of the cable materials.

Informational Note No. 1: These markings include, but are not limited to, markings for limited smoke, halogen free, low smoke and halogen free, and sunlight resistant.

Informational Note No. 2: Some examples of optional markings are ST1 to indicate limited smoke characteristics in accordance with UL 2556, *Wire and Cable Test Methods* ; HF to indicate halogen free as described in UL 2885, *Outline of Investigation for Acid Gas, Acidity and Conductivity of Combusted Materials* ; and LSHF to indicate halogen free and low smoke characteristics in accordance with IEC 61034-2, *Measurement of smoke density of cables burning under defined conditions — Part 2: Test procedure and requirements* .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:08:34 EDT 2018

Committee Statement

Committee Statement: The provision for optional marking referenced in 310.120(D) and 310.8(D) covers only Chapter 3 wiring methods. Including examples of optional marking designations and available performance standards will reduce confusion.

Response Message: SR-7990-NFPA 70-2018

Public Comment No. 1364-NFPA 70-2018 [Section No. 725.179(K)]

Public Comment No. 506-NFPA 70-2018 [Section No. 725.179(K)]

Second Revision No. 7995-NFPA 70-2018 [Section No. 727.2]

727.2 Definition.

The definition in this section shall apply within this article and throughout the *Code* .

Type ITC Instrumentation Tray Cable.

A factory assembly of two or more insulated conductors, with or without an equipment grounding conductor(s), enclosed in a nonmetallic sheath.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:14:20 EDT 2018

Committee Statement

Committee Statement: The revised language is part of a global effort to provide guidance to the user of the code regarding applicability of definitions located in the XXX.2 sections within individual articles. The language makes it clear that the definition is not limited to Article 727.

Response Message: SR-7995-NFPA 70-2018

Public Comment No. 2118-NFPA 70-2018 [Section No. 727.2]

Public Comment No. 1188-NFPA 70-2018 [Section No. 727.2]

Second Revision No. 8000-NFPA 70-2018 [Section No. 728.2]

728.2 Definition.

The definition in this section shall apply within this article and throughout the *Code* .

Fire-Resistive Cable System.

A cable and components used to ensure survivability of critical circuits for a specified time under fire conditions.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:18:54 EDT 2018

Committee Statement

Committee Statement: The revised language is part of a global effort to provide guidance to the user of the code regarding applicability of definitions located in the XXX.2 sections within individual articles. The language makes it clear that the definition is not limited to Article 728.

Response Message: SR-8000-NFPA 70-2018

Public Comment No. 1172-NFPA 70-2018 [Section No. 728.2]

Public Comment No. 2120-NFPA 70-2018 [Section No. 728.2]

Second Revision No. 8001-NFPA 70-2018 [Section No. 728.60]

728.60 Equipment Grounding Conductor .

Fire-resistive systems installed in a raceway requiring an equipment grounding conductor shall use the same fire-rated cable described in the system, unless alternative equipment grounding conductors are listed with the system. Any alternative equipment grounding conductor shall be marked with the system number. The system shall specify a permissible equipment grounding conductor. If not specified, the equipment grounding conductor shall be the same as the fire-rated cable described in the system.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:20:52 EDT 2018

Committee Statement

Committee Statement: Changing the title is consistent with the use of the term in Articles 250 and 100.

Response Message: SR-8001-NFPA 70-2018

Public Comment No. 356-NFPA 70-2018 [Section No. 728.60]

Second Revision No. 8003-NFPA 70-2018 [Section No. 760.2]

760.2 Definitions.

The definitions in this section shall apply only within this article.

Abandoned Fire Alarm Cable.

Installed fire alarm cable that is not terminated at equipment other than a connector and not identified for future use with a tag.

Fire Alarm Circuit.

The portion of the wiring system between the load side of the overcurrent device or the power-limited supply and the connected equipment of all circuits powered and controlled by the fire alarm system. Fire alarm circuits are classified as either non–power-limited or power-limited.

Fire Alarm Circuit Integrity (CI) Cable.

Cable used in fire alarm systems to ensure continued operation of critical circuits during a specified time under fire conditions.

Non–Power-Limited Fire Alarm Circuit (NPLFA).

A fire alarm circuit powered by a source that complies with 760.41 and 760.43.

Power-Limited Fire Alarm Circuit (PLFA).

A fire alarm circuit powered by a source that complies with 760.121.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:22:57 EDT 2018

Committee Statement

Committee Statement: The revised language is part of a global effort to provide guidance to the user of the code regarding applicability of definitions located in the XXX.2 sections within individual articles. The language makes it clear that the definitions are limited to Article 760.

Response Message: SR-8003-NFPA 70-2018

Public Comment No. 2122-NFPA 70-2018 [Section No. 760.2]

Public Comment No. 1173-NFPA 70-2018 [Section No. 760.2]

Second Revision No. 8034-NFPA 70-2018 [Section No. 760.3(L)]

(L) Cable Routing Assemblies.

Power-limited fire alarm cables shall be permitted to be installed in plenum cable routing assemblies, riser cable routing assemblies, and general-purpose cable routing assemblies selected in accordance with ~~Table 805.154(c)~~ Table 800.154(c) , listed in accordance with the provisions of 800.182, and installed in accordance with ~~805.110(C)~~ 800.110(C) and ~~805.113~~ 800.113 .

(M) Communications Raceways.

Power-limited fire alarm cables shall be permitted to be installed in plenum communications raceways, riser communications raceways, and general-purpose communications raceways selected in accordance with ~~Table 805.154(b)~~ Table 800.154(b) , listed in accordance with the provisions of 800.182, and installed in accordance with ~~805.113~~ 800.113 and 362.24 through 362.56, where the requirements applicable to electrical nonmetallic tubing apply.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Tue Oct 30 12:33:33 EDT 2018

Committee Statement

Committee Statement: References to Article 805 have been updated to reflect the sections that have been relocated to Article 800.

Response Message: SR-8034-NFPA 70-2018

Public Comment No. 114-NFPA 70-2018 [Sections 760.3(L), 760.3(M)]

Second Revision No. 8004-NFPA 70-2018 [New Section after 760.3(N)]

(O) Identification of Equipment Grounding Conductors.

Equipment grounding conductors shall be identified in accordance with 250.119 .

Exception: Conductors with green insulation shall be permitted to be used as ungrounded signal conductors for Types FPLP, FPLR, FPL, and substitute cables installed in accordance with 760.154(A) .

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:29:32 EDT 2018

Committee Statement

Committee Statement: Section 760.3(O) has been added to permit certain systems operating at over 50 volts to use green conductors as other than equipment grounding conductors.

Response Message: SR-8004-NFPA 70-2018

Public Comment No. 1948-NFPA 70-2018 [New Section after 760.3(N)]

Second Revision No. 8008-NFPA 70-2018 [Section No. 760.24(A)]

(A) General.

Fire alarm circuits shall be installed in a neat workmanlike manner. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that the cable will not be damaged by normal building use. Such cables shall be supported by straps, staples, cable ties, hangers, or similar fittings designed and installed so as not to damage the cable. The installation shall also comply with ~~300.4(D)~~ 300.4 .

Informational Note: Paint, plaster, cleaners, abrasives, corrosive residues, or other contaminants might result in an undetermined alteration of PLFA and NPLFA cable properties.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:36:37 EDT 2018

Committee Statement

Committee Statement: The reference to 300.4(D) was changed to 300.4 to reflect the accurate section number.

Response Message: SR-8008-NFPA 70-2018

Public Comment No. 601-NFPA 70-2018 [Section No. 760.24(A)]

Public Comment No. 1496-NFPA 70-2018 [Section No. 760.24(A)]

Public Comment No. 1751-NFPA 70-2018 [Section No. 760.24(A)]

Second Revision No. 8009-NFPA 70-2018 [New Section after 760.35]

760.36 Surge Protection.

If a surge protective device is installed with fire alarm circuit wire and cable, it shall be listed for the purpose.

Submitter Information Verification

Committee: NEC-P03

Submittal Date: Mon Oct 29 19:41:34 EDT 2018

Committee Statement

Committee Statement: Requiring a listed surge protector to be installed will offer a false sense of security as there is no way of knowing if the installed surge protector would actually protect the circuit in question. Because of this, CMP-3 opposes requiring surge protection. Protection needs to be designed into the installed systems. Since auxiliary surge protectors can always be installed external to the equipment it would be appropriate to require these to be listed.

Response Message: SR-8009-NFPA 70-2018

Public Comment No. 59-NFPA 70-2018 [New Section after 760.35]