



First Revision No. 4643-NFPA 70-2015 [Global Input]

VI. Premises Powering of Communications Equipment over Communications Cables

Informational Note: This Part addresses types of circuits intended to provide power over coaxial cables and communications wires and cables to remote equipment, including systems such as Power over Ethernet (PoE). These premises-powering systems do not include circuits such as those that provide plain old telephone services (POTS), traditional CATV services and similar legacy communications services.

840.160 Powering Circuits. Communications cables, in addition to carrying the communications circuit, shall also be permitted to carry circuits for powering communications equipment. The communications cables and the powering circuits shall comply with 840.160(A), (B) and (C), as applicable.

(A) Power Limitations. The power circuits shall comply with the requirements of Table 11(B) in Chapter 9 for voltage sources up to 60 V dc.

Informational Note: The 100 VA (100 W) power source maximum nameplate rating in Chapter 9, Table 11(B) is the same as the maximum power rating for network-powered broadband communications systems in Table 830.15, the communications industry standard in ATIS-0600337.2010 and UL 60950-21.

(B) Ampacity. The maximum current carried by each communications conductor shall conform to Table 840.160(A).

Informational Note: The ampacity of the small wire gauges used in communications cables are not included in the ampacity tables in Article 310.

(C) Installations of New Cables. New cables installed for carrying both communications and power, where the maximum adjusted ampacity of conductors exceed the values in Table 840.160(A), shall be Type CMP-LP, CMR-LP or CM-LP, as applicable.

(D) Using Cables Without the "LP" Marking for Supplying Premises Power and Communications. New and existing cables without the "LP" marking shall be permitted to connect to communications equipment that supplies communications and power in accordance with the voltage and power limitations of Table 11(B) in Chapter 9 for voltage sources up to 60 V dc, provided that the maximum current supplied by the power source is less than the adjusted ampacity of conductors in Table 840.160(A). For ambient temperatures other than 30°C (86°F) ampacity shall be permitted to be adjusted per Table 310.15(B)(2)(a).

Table 840.160(A), Communications Conductor Ampacity Based on Copper Conductors at Ambient Temperature of 30°C (86°F), Conductor Temperature 60° C (140° F)

Supplemental Information

<u>File Name</u>	<u>Description</u>
840_160A_FR4643_final.docx	Table 840.160(A)

Submitter Information Verification

Submitter Full Name: CMP 16
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submission Date: Fri Jan 16 08:02:42 EST 2015

Correlating Committee Actions

The correlating committee may override this FR with a First Correlating Revision or with a Committee Note

Committee Statement

Committee Statement: The new Part VI accommodates power over Ethernet (PoE) and other powering systems that provide power over the data communications cables. PoE is widely used with communications circuits and each successive revision of the PoE standards delivers more power to the powered devices raising concern about overheating of the cables. Bundling and bunching of cables carrying power to communications equipment can result in heating. No conductor (or cable) should be used in such a manner that its operating temperature exceeds the maximum temperature it was rated for. Sections 770.179 and 800.179 require that optical fiber cables and communications cables have a temperature rating of not less than 60°C (140°F). Where cables carrying communications and power are installed, cables rated for temperatures above 60°C (140°F) may be required. How much higher is dependent on many factors, including ambient temperature, spacing and ventilation among cable bundles and bunches, wire gauge and power being dissipated in the cables.

The new Part VI provides for the use of new cables with properties chosen to be safe in worst-case installation conditions. The listing requirements for these cables are in 840.170. Similar to CMP-CI, CMR-CI and CM-CI cables, the new cables are marked Types CMP-LP, CMR-LP and CM-LP. These cables are listed to have adequate ampacity (wire gauge) and temperature rating for worst-case ambient thermal conditions e.g., a hot attic, and worst case heating produced by the maximum permissible current being carried by the cables.

The Part VI also permits for the use of new non-LP marked cables and previously installed cables provided the current is limited so that the cables do not overheat.

Ampacity values in Table 840.160(a) were derived based on review of Reference Data for Engineers: Radio, Electronics, Computer and Communications, 7th Ed., and NFPA 79, 12.5.1. Adjustments were made considering Article 522 of the NEC, and other sources

CMP-16 chooses not to include Information Note No. 2 with reference to http://wiki.xtronics.com/index.php/Wire-Gauge_Ampacity as provided by the submitter. Data does not necessarily add value to the data in Table 840.160(A). Changes made by CMP-16 meet the intent of the submitter.

Response Message:

[Public Input No. 1861-NFPA 70-2014 \[New Section after 840.154\]](#)

Ballot Results

✔ This item has passed ballot

- 17 Eligible Voters
- 0 Not Returned
- 14 Affirmative All
- 2 Affirmative with Comments
- 1 Negative with Comments
- 0 Abstention

Affirmative All

Bish, George
Brunssen, James E.
Dawson, Fred C.
Dorna, Gerald Lee
Jensen, Robert W.
Johnson, Steven C.
Lawrence, Eric
McNamara, Jack
Moore, Thomas E.
Murphy, Michael F.
Ohde, Harold C.

Parrish, Thomas J.
Pirkle, W. Douglas
Zieman, Leo

Affirmative with Comment

Ivans, Randolph J.

We agree with the addition of this new section in Article 840. However, the structure and wording of 840.160 are confusing. For example, except for the temperature adjustment information, "(D)" is just a repetition of "(A)" and "(B)". "(B)" says you have to meet current limits then "(C)" says you don't. In addition, there needs to be current limitations included for the type -LP cables even though they may be higher than permitted by Table 840.160(A). Finally, since Chapter 9, Table 11(B) has limitations for maximum power and current and rated power and current, these need to be identified in the text. Suggested revisions are as follows: 840.160 Powering Circuits. Communications cables, in addition to carrying the communications circuit, shall also be permitted to carry circuits for powering communications equipment. The communications cables and the powering circuits shall comply with 840.160(A), (B) and (C). (A) Maximum Power and Current Limitations. The maximum power (V_{Amax}) and current (I_{max}) limitations of the powering circuits shall comply with the Class 2 requirements of Table 11(B) in Chapter 9 for voltage sources up to 60 V dc. (B) Rated Power. The maximum rated power of the powering circuit shall comply with the Class 2 requirements of Table 11(B) in Chapter 9 for voltage sources up to 60 V dc. Informational Note: The 100 VA (100 W) power source maximum nameplate rating in Chapter 9, Table 11(B) is the same as the maximum power rating for network-powered broadband communications systems in Table 830.15, the communications industry standard in ATIS-0600337.2010 and UL 60950-21. (C) Rated Current. The maximum rated current of the power source that may be carried by each communications cable conductor shall conform to 840.160(C)(1) or 840.160(C)(2). Informational Note: The ampacity of the small wire gauges used in communications cables are not included in the ampacity tables in Article 310. (1) Installations of New Cables. New cables type CMP-LP, CMR-LP or CM-LP, as applicable, installed for carrying both communications and power, shall be supplied by a power source with a maximum current rating that is less than the maximum adjusted ampacity of the conductors in Table 840.160(XX). For ambient temperatures other than 30°C (86°F) ampacity shall be permitted to be adjusted per Table 310.15(B)(2)(a). (2) New and Existing non-LP Cables. New and existing cables without the "LP" marking shall be permitted to connect to communications equipment that supplies communications and power provided that the maximum current supplied by the power source is less than the adjusted ampacity of conductors in Table 840.160(A). For ambient temperatures other than 30°C (86°F) ampacity shall be permitted to be adjusted per Table 310.15(B)(2)(a).

McCoy, William J.

Table 840.160(A) is missing from the FR. Also, The ampacities for other than 30°C temperature ratings need to be addressed and requires additional research. Definition of separation and wiring methods must be addressed as part of the ratings. Applications will be such that temperatures other than 30 degrees C will be encountered.

Negative with Comment

Prezioso, Luigi G.

While there is a potential issue with the overheating of cables that are powering network devices, there was no evidence of an existing safety hazard presented, and therefore no justification for an entirely new cable listing. The development of the requirements is not based on solid evidence and needs further investigation prior to being made part of the Code. The requirement to use the "LP" in new installations "New cables installed for carrying both communications and power, where the maximum adjusted ampacity of conductors exceed the values in Table 840.160(A), shall be Type CMP-LP, CMR-LP or CM-LP, as applicable." requires the infrastructure designers to determine "the maximum adjusted ampacity of conductors" at the time the infrastructure design is completed. This is potentially years before the network design has been completed and possibly before a new, future networking solution has even been identified.