

systems may also include network components such as amplifiers that require network power.

Network-powered broadband communications circuits provide a wide array of subscriber services, including voice, data (such as Internet access), interactive services, and television signals.

Article 830 contains requirements for wiring both the inside and the outside of buildings. Other articles cover the wiring derived from the network interface unit (NIU) into the premises. The major difference between Articles 820 and 830 is the voltage present on the circuit conductors. Article 820 systems are limited to 60 volts, but Article 830 systems are permitted to have ratings as high as 150 volts. Higher voltages allow systems to power more sophisticated electronics and to provide a wider variety of services.

Δ **830.15 Power Limitations.** Network-powered broadband communications systems shall be classified as having low- or medium-power sources as specified in the following:

- (1) Sources shall be classified as defined in Table 830.15.
- (2) Direct-current power sources exceeding 150 volts to ground, but no more than 200 volts to ground, with the current to ground limited to 10 mA dc, that meet the current and power limitation for medium-power sources in Table 830.15 shall be classified as medium-power sources.

Informational Note: See UL 60950-21-2007, *Standard for Safety for Information Technology Equipment — Safety — Part 21: Remote Power Feeding*, for listing information on equipment that complies with 830.15(2).

Δ **TABLE 830.15** Limitations for Network-Powered Broadband Communications Systems

Network Power Source	Low	Medium
Circuit voltage, $V_{\max}$ (volts) <sup>1</sup>	0–100	0–150
Power limitation, $VA_{\max}$ (volt-amperes) <sup>1</sup>	250	250
Current limitation, $I_{\max}$ (amperes) <sup>1</sup>	$1000/V_{\max}$	$1000/V_{\max}$
Maximum power rating (volt-amperes)	100	100
Maximum voltage rating (volts)	100	150
Maximum overcurrent protection (amperes) <sup>2</sup>	$100/V_{\max}$	NA

<sup>1</sup> $V_{\max}$ ,  $I_{\max}$ , and  $VA_{\max}$  are determined with the current-limiting impedance in the circuit (not bypassed) as follows:

$V_{\max}$  — Maximum system voltage regardless of load with rated input applied

$I_{\max}$  — Maximum system current under any noncapacitive load, including short circuit, and with overcurrent protection bypassed if used.  $I_{\max}$  limits apply after 1 minute of operation

$VA_{\max}$  — Maximum volt-ampere output after 1 minute of operation regardless of load and overcurrent protection bypassed if used

<sup>2</sup>Overcurrent protection is not required if the current-limiting device provides equivalent current limitation and the current-limiting device does not reset until power or the load is removed.

Only network-powered broadband systems that operate within the voltage, current, and power parameters specified in Table 830.15 or a direct current (dc) system operating at not more than 200 volts and 10 milliamperes to ground are permitted. The dc systems must meet the current and power limitations for medium-power systems specified in Table 830.15.

## Part II. Cables Outside and Entering Buildings

**830.40 Entrance Cables.** Network-powered broadband communications cables located outside and entering buildings shall comply with 830.40(A) and (B).

(A) **Medium-Power Circuits.** Medium-power network-powered broadband communications circuits located outside and entering buildings shall be installed using Type BMU, Type BM, or Type BMR network-powered broadband communications medium-power cables.

Δ (B) **Low-Power Circuits.** Low-power network-powered broadband communications circuits located outside and entering buildings shall be installed using Type BLU or Type BLX low-power network-powered broadband communications cables. Cables shown in Table 830.154 shall be permitted to substitute.

**830.44 Overhead (Aerial) Cables.** Overhead (aerial) network-powered broadband communications cables shall comply with 830.44(A) through (F).

Network-powered broadband communications systems can contain sufficient energy to pose an electric shock hazard. For that reason, they are subject to requirements similar to those for overhead power conductors.

Overhead (aerial) spans of network-powered broadband communications cables must be of sufficient size and strength to maintain clearances and must avoid possible contact with light or power conductors. Splices and joints must be made with approved connectors or other means that provide sufficient mechanical strength so that conductors are not weakened, which could cause them to break and come into contact with higher-voltage conductors.

### See also

**800.44** for general requirements for overhead (aerial) communications wires and cables

(A) **On Poles and In-Span or Above Roofs.** Where network-powered broadband communications cables are installed on poles and in-span or above roofs, they shall comply with 800.44.

Δ (B) **Clearance from Ground.** Overhead (aerial) spans of network-powered broadband communications cables shall conform to not less than the following:

- (1) 2.9 m (9½ ft) — above finished grade, sidewalks, or from any platform or projection from which they might be reached and accessible to pedestrians only