

attachment plug and receptacle of proper rating shall be permitted to serve as a disconnecting means.

### 517.73 Rating of Supply Conductors and Overcurrent Protection.

(A) **Branch Circuits.** The ampacity of supply branch-circuit conductors and the current rating of overcurrent protective devices shall not be less than 50 percent of the momentary rating or 100 percent of the long-time rating, whichever is greater.

- Δ (B) **Feeders.** The ampacity of supply feeders and the current rating of overcurrent protective devices supplying two or more branch circuits supplying diagnostic imaging and treatment equipment shall not be less than 50 percent of the momentary demand rating of the largest unit, plus 25 percent of the momentary demand rating of the next largest unit, plus 10 percent of the momentary demand rating of each additional unit.

**Informational Note No. 1:** The minimum conductor size for branch and feeder circuits is also governed by voltage regulation requirements. For a specific installation, the manufacturer usually specifies minimum distribution transformer and conductor sizes, rating of disconnecting means, and overcurrent protection.

**Informational Note No. 2:** The ampacity of the branch-circuit conductors and the ratings of disconnecting means and overcurrent protection for diagnostic imaging and treatment equipment are usually designated by the manufacturer for the specific installation.

### 517.74 Control Circuit Conductors.

(A) **Number of Conductors in Raceway.** The number of control circuit conductors installed in a raceway shall be determined in accordance with 300.17.

(B) **Minimum Size of Conductors.** Size 18 AWG or 16 AWG fixture wires in accordance with 724.49 and flexible cords shall be permitted for the control and operating circuits of diagnostic imaging and treatment equipment and auxiliary equipment where protected by not larger than 20-ampere overcurrent devices.

• **517.76 Transformers and Capacitors.** Transformers and capacitors that are part of diagnostic imaging and treatment equipment shall not be required to comply with Parts I and II of Articles 450 and 460.

Capacitors shall be mounted within enclosures of insulating material or grounded metal.

- Δ **517.77 Installation of Cables with Grounded Shields.** Cables with grounded shields shall be permitted to be installed in cable trays or cable troughs along with control and power supply conductors without the need for barriers to separate the wiring.

### 517.78 Guarding and Grounding.

- Δ (A) **High-Voltage Parts.** All high-voltage parts shall be mounted within grounded enclosures. The connection from the

high-voltage equipment to other high-voltage components shall be made with high-voltage shielded cables.

(B) **Low-Voltage Cables.** Low-voltage cables connecting to oil-filled units that are not completely sealed, such as transformers, condensers, oil coolers, and high-voltage switches, shall have insulation of the oil-resistant type.

- Δ (C) **Non-Current-Carrying Metal Parts.** Non-current-carrying metal parts of diagnostic imaging and treatment equipment (e.g., controls, tables, transformer tanks, shielded cables) shall be connected to an equipment grounding conductor in accordance with Part VII of Article 250, as modified by 517.13(A) and (B).

## Part VI. Communications, Signaling Systems, Data Systems, Fire Alarm Systems, and Systems Less Than 120 Volts, Nominal

**517.80 Patient Care Spaces.** Equivalent insulation and isolation to that required for the electrical distribution systems in patient care areas shall be provided for communications, signaling systems, data system circuits, fire alarm systems, and systems less than 120 volts, nominal.

Class 2 and Class 3 signaling and communications systems, Class 2 circuits that transmit power and data to a powered device, and power-limited fire alarm systems shall not be required to comply with the grounding requirements of 517.13, to comply with the mechanical protection requirements of 517.31(C)(3)(5), or to be enclosed in raceways, unless otherwise specified by Chapters 7 or 8.

Secondary circuits of transformer-powered communications or signaling systems shall not be required to be enclosed in raceways unless otherwise specified by Chapters 7 or 8. [99:6.7.2.2.7]

**Informational Note:** 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.

A primary objective of Article 517 is to minimize patients' exposure to any level of current that could injure them. The equivalent insulation and isolation of these circuits from contact by the patient is for protection from any level of shock hazard that could result from inadvertent contact with energized circuit conductors or parts associated with the limited energy systems. Nurse call, intercom, speaker, cable television, fire alarm systems, and equipment powered and receiving data from Class 2 circuits are examples of the types of circuits covered by this requirement.

### See also

**517.1**, Informational Note No. 1, for more information on sensitivity to shock hazards

Class 2 and Class 3 remote control and signaling circuits, Class 2 power circuits that provide power and data to powered equipment, as well as power-limited fire alarm circuits that are