

shall be listed “hospital grade” for services of prescribed voltage, frequency, rating, and number of conductors with provision for connection of the equipment grounding conductor. This requirement shall apply to 2-pole, 3-wire grounding type for single-phase, 120-, 208-, or 240-volt, nominal, ac service.

**(3) 250-Volt Receptacles and Attachment Plugs Rated 50 Amperes and 60 Amperes.** Receptacles and attachment plugs rated 250 volts, for connection of 50-ampere and 60-ampere ac medical equipment for use in unclassified locations, shall be arranged so that the 60-ampere receptacle will accept either the 50-ampere or the 60-ampere plug. Fifty-ampere receptacles shall be designed so as not to accept the 60-ampere attachment plug. The attachment plugs shall be of the 2-pole, 3-wire design with a third contact connecting to the insulated (green or green with yellow stripe) equipment grounding conductor of the electrical system.

**517.62 Grounding.** In any anesthetizing area, all metal raceways and metal-sheathed cables and all normally non-current-carrying conductive portions of fixed electrical equipment shall be connected to an equipment grounding conductor. Grounding and bonding in Class I locations shall comply with 501.30.

*Exception: Equipment operating at not more than 10 volts between conductors shall not be required to be connected to an equipment grounding conductor.*

The grounding requirements for anesthetizing locations apply to metal raceways, metal-sheathed cables, and electrical equipment. Carts, tables, and other nonelectrical items are not required to be grounded.

### 517.63 Grounded Power Systems in Anesthetizing Locations.

**(A) Battery-Powered Lighting Units.** One or more battery-powered lighting units shall be provided and shall be permitted to be wired to the critical lighting circuit in the area and connected ahead of any local switches.

Failure of the emergency circuit feeder that supplies an operating room will ordinarily plunge the room into darkness. Unless an uninterruptible power supply is installed, a delay in the restoration of illumination could occur until the alternate source of the essential electrical system comes on-line. Even though such a delay is limited to 10 seconds (per 517.32), loss of illumination at a critical point in a surgical procedure could result in danger to the patient or operating room personnel. To safeguard against being thrust into complete darkness upon interruption of normal power, at least one battery-operated emergency lighting unit is required to be installed. This type of unit provides immediate illumination upon loss of power, helping to mitigate the impact of sudden interruption of the normal illumination. It is permitted to connect the lighting unit to the critical branch circuit.

**(B) Branch-Circuit Wiring.** Branch circuits supplying only listed, fixed, therapeutic and diagnostic equipment, permanently installed above the hazardous (classified) location and in unclassified locations, shall be permitted to be supplied from a normal

grounded service, single- or three-phase system, provided the following apply:

- (1) Wiring for grounded and isolated circuits does not occupy the same raceway or cable.
- (2) All conductive surfaces of the equipment are connected to an equipment grounding conductor.
- (3) Equipment (except enclosed X-ray tubes and the leads to the tubes) is located at least 2.5 m (8 ft) above the floor or outside the anesthetizing location.
- (4) Switches for the grounded branch circuit are located outside the hazardous (classified) location.

*Exception: Sections 517.63(B)(3) and (B)(4) shall not apply in unclassified locations.*

**(C) Fixed Lighting Branch Circuits.** Branch circuits supplying only fixed lighting shall be permitted to be supplied by a normal grounded service, provided the following apply:

- (1) Such luminaires are located at least 2.5 m (8 ft) above the floor.
- (2) All conductive surfaces of luminaires are connected to an equipment grounding conductor.
- (3) Wiring for circuits supplying power to luminaires does not occupy the same raceway or cable for circuits supplying isolated power.
- (4) Switches are wall-mounted and located above hazardous (classified) locations.

*Exception: Sections 517.63(C)(1) and (C)(4) shall not apply in unclassified locations.*

**(D) Remote-Control Stations.** Wall-mounted remote-control stations for remote-control switches operating at 24 volts or less shall be permitted to be installed in any anesthetizing location.

**(E) Location of Isolated Power Systems.** Where an isolated power system is utilized, the isolated power equipment shall be listed as isolated power equipment. Isolated power system equipment and its supply circuit shall be permitted to be located in an anesthetizing location, provided it is installed above a hazardous (classified) location or in an unclassified location.

**(F) Circuits in Anesthetizing Locations.** Except as permitted above, each power circuit within, or partially within, a flammable anesthetizing location as referred to in 517.60 shall be isolated from any distribution system supplying other-than-anesthetizing locations.

### 517.64 Low-Voltage Equipment and Instruments.

**(A) Equipment Requirements.** Low-voltage equipment that is frequently in contact with the bodies of persons or has exposed current-carrying elements shall comply with one of the following:

- (1) Operate on an electrical potential of 10 volts or less
- (2) Be approved as intrinsically safe or double-insulated equipment
- (3) Be moisture resistant