be smaller than the ungrounded conductors where the maximum demand of a range of 8¾ kW or more rating has been calculated according to Column C of Table 220.55, but such conductor shall have an ampacity of not less than 70 percent of the branch-circuit rating and shall not be smaller than 10 AWG.

Column C of Table 220.55 indicates that the maximum demand for one range (not over 12-kilowatt rating) is 8 kilowatts (8000 VA; 8000 VA ÷ 240 V = 33.3 A). The ampacity of an 8 AWG copper conductor from the 60°C column of Table 310.16 is 40 amperes, and this conductor may be used for the range branch circuit. According to Exception No. 2, the neutral of this 3-wire circuit can be smaller than 8 AWG but not smaller than 10 AWG. A 10 AWG conductor has an ampacity of 30 amperes (30 amperes is more than 70 percent of 40 amperes). The maximum demand for the neutral of an 8-kilowatt range circuit seldom exceeds 25 amperes because the only line-to-neutral connected loads are lights, clocks, timers, and the heating elements of some ranges when the control is adjusted to the low-heat setting.

(D) Other Loads. Branch-circuit conductors that supply loads other than those specified in 210.3 and other than cooking appliances as covered in 210.19(C) shall have an ampacity sufficient for the loads served and shall not be smaller than 14 AWG.

Exception No. 1: Tap conductors shall have an ampacity sufficient for the load served. In addition, they shall have an ampacity of not less than 15 for circuits rated less than 40 amperes and not less than 20 for circuits rated at 40 or 50 amperes and only where these tap conductors supply any of the following loads:

(1) Individual lampholders or luminaires with taps extending not longer than 450 mm (18 in.) beyond any portion of the lampholder or luminaire
(2) A luminaire having tap conductors in accordance with 410.117
(3) Individual outlets, other than receptacle outlets, with taps not over 450 mm (18 in.) long
(4) Infrared lamp industrial heating appliances
(5) Nonheating leads of deicing and snow-melting cables and mats

Exception No. 2: Fixture wires and flexible cords shall be permitted to be smaller than 14 AWG as permitted by 240.5.

210.20 Overcurrent Protection. Branch-circuit conductors and equipment for circuits not exceeding 1000 volts ac or 1500 volts dc shall be protected by overcurrent protective devices that have a rating or setting that complies with 210.20(A) through (D).

(A) Continuous and Noncontinuous Loads. Where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than the noncontinuous load plus 125 percent of the continuous load.

Exhibit 210.24 is an example of a calculation of a minimum branch-circuit rating for a continuous load (store lighting). The

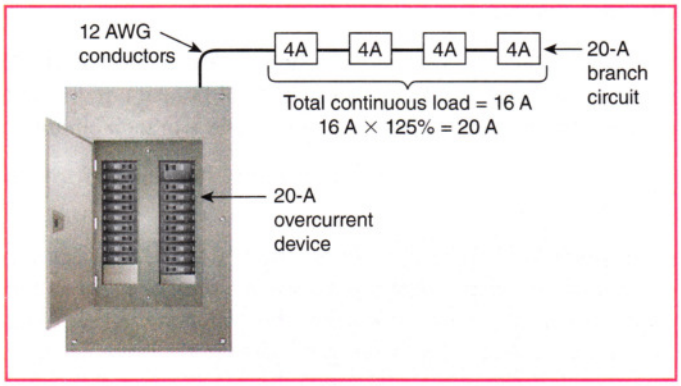

EXHIBIT 210.24 A continuous load calculated at 125 percent.

125 percent requirement from 210.20(A) has been applied to the 16 amperes of continuous load, making it permissible to use a 20-ampere rated overcurrent device in this application.

Exception: Where the assembly, including the overcurrent devices protecting the branch circuit(s), is listed for operation at 100 percent of its rating, the ampere rating of the overcurrent device shall be permitted to be not less than the sum of the continuous load plus the noncontinuous load.

Section 210.19(A)(1) requires that the circuit conductors have an ampacity based on the larger of these two criteria:

- Not less than the sum of the noncontinuous load plus 125 percent of the continuous load
- Not less than the maximum load to be served after the application of any adjustment or correction factors

The rating of the overcurrent device cannot exceed the ampacity of the branch-circuit conductors after correction factors have been applied or be less than the load served.

See also

220.61 for sizing of the neutral conductor load

(B) Conductor Protection. Conductors shall be protected in accordance with 240.4. Flexible cords and fixture wires shall be protected in accordance with 240.5.

(C) Equipment. The rating or setting of the overcurrent protective device shall not exceed that specified in the applicable articles referenced in Table 240.3 for equipment.

(D) Outlet Devices. The rating or setting shall not exceed that specified in 210.21 for outlet devices.

210.21 Outlet Devices. Outlet devices shall have an ampere rating that is not less than the load to be served and shall comply with 210.21(A) and (B).

(A) Lampholders. Where connected to a branch circuit having a rating in excess of 20 amperes, lampholders shall be of the heavy-duty type. A heavy-duty lampholder shall have a rating of not less than 660 watts if of the admedium type, or not less than 750 watts if of any other type.