Receptacle outlets required for kitchen countertops [210.52(C)].

Areas supplied by the small-appliance circuits [210.52(B)(1)].

AUTHOR'S COMMENT: 210.52(B)(1) states that the refrigerator outlet is part of a small-appliance circuit. The refrigerator outlet is also permitted to be on an individual 15 or 20A branch circuit [210.52(B)(1) Ex 1].

9.5 Cooking Equipment—Branch Circuit [Table 220.55, Note 4]

To determine the branch-circuit calculated load for household ranges and cooking equipment, we are allowed to apply the provisions of Table 220.55, Note 4. The branch-circuit calculated load for one range may be calculated according to the demand factors listed in Table 220.55, but a minimum 40A circuit is required for ranges rated 8.75 kVA and larger [210.19(A)(3)].

▶ Less Than 12 kVA, Column C

What is the branch-circuit calculated load (in amperes) for one 9 kVA range? Figure 9–4

(a) 21A (b) 27A
(c) 38A (d) 33A

• Answer: (d) 33A

The calculated load for one range in Table 220.55 Column C is 8 kVA.

This can be converted to amperes by dividing the power by the voltage:

I = VA/E
I = (8 kVA x 1,000)/240V*
I = 33A

*Assume 120/240V, single-phase for all calculations unless the question gives a specific voltage and system [220.5(A)].

▶ More than 12 kVA, Table 220.55 Note 1

What is the branch-circuit load for one 14 kVA range? Figure 9–5

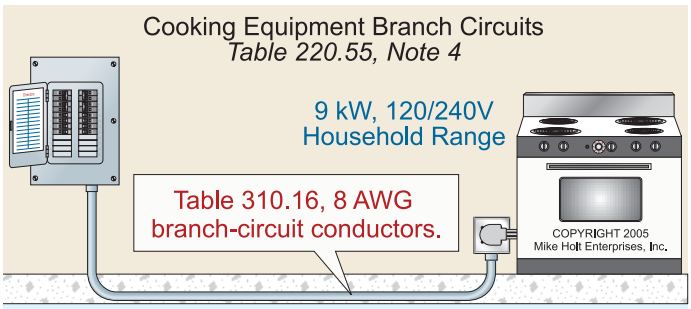
(a) 33A (b) 37A (c) 50A (d) 58A

• Answer: (b) 37A

Step 1: Since the range exceeds 12 kVA, follow Note 1 of Table 220.55. The first step is to determine the calculated load as listed in Column C of Table 220.55 for one unit = 8 kVA.

Step 2: We must increase the Column C value (8 kVA) by 5% for each kVA that the range exceeds 12 kVA. In this case, 14 kVA exceeds 12 kVA by 2 kVA. This results in an increase of the Column C value (8 kVA) by 10%, 8 kVA x 1.1 = 8.8 kVA or 8,800W.

Step 3: Convert the calculated load to amperes.
I = VA/E
I = 8,800 VA/240V
I = 36.7A



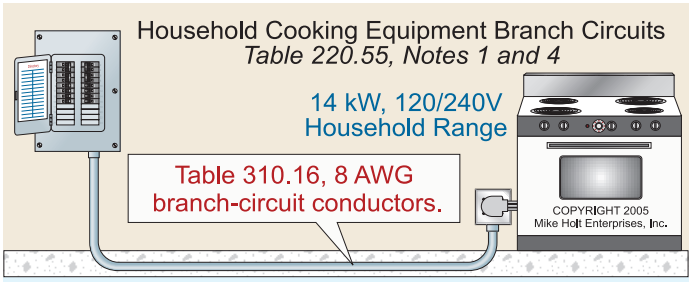
Size the branch circuit for a 9 kW range.

Branch-Circuit Conductor Size, Table 220.55, Note 4
Column C = 8 kW demand

$$I = \frac{P}{E} = \frac{8{,}000W}{240V} = 33A$$

Table 310.16 = 8 AWG Conductor

Figure 9–4



Size the branch circuit for a 14 kW range.

Branch-Circuit Conductor: Table 220.55, Note 4; use Note 1
Step 1: Column C, one unit = 8 kW demand.
Step 2: Increase Column C answer by 5% for each kW over 12 kW.
14 kW - 12 kW = 2 kW over 12 kW
2 kW x 5% = 10% increase in Column C answer
8 kW x 1.10 = 8.8 kW demand
Step 3: Convert the demand load into amperes.
P = 8.8 kW x 1,000 = 8,800W
E = 240V

$$I = \frac{P}{E} = \frac{8{,}800W}{240V} = 37A$$