

# RESIDENTIAL ELECTRICAL SERVICE SIZING Based on the 2001 California Electrical Code

NEC Code Load/Circuit Reference

## GENERAL LIGHTING AND SMALL APPLIANCE

220-3b Living area sqft. \_\_\_\_\_ x 3 volt-amperes (VA) per sqft. . . . . = \_\_\_\_\_ VA (1)

220-16a Small appliance circuits (2 min.) \_\_\_\_\_ X 1500 VA. . . . . = \_\_\_\_\_ VA (2)

220-16b Laundry circuit (s) \_\_\_\_\_ X 1500 VA. . . . . = \_\_\_\_\_ VA (3)

Lighting Load Subtotal (Total Lines 1-3) . . . . . = \_\_\_\_\_ VA (4)

Adjust Light Load as Follows:

220-11 The first 3000 VA of lighting load at 100% . . . . . = \_\_\_\_\_ VA (5)

Volt-Amperes over 3001 to 12000 VA \_\_\_\_\_ at 35%. . . . . = \_\_\_\_\_ VA (6)

Total Volt-Amperes over 12000 VA \_\_\_\_\_ at 25%. . . . . = \_\_\_\_\_ VA (7)

ADJUSTED LIGHTING & SMALL APPLIANCE TOTAL (Total Lines 4 -7). . . . . = \_\_\_\_\_ VA (A)

220-19 **COOKING APPLIANCES:** electrical ranges, ovens, counter cooking units etc. . = \_\_\_\_\_ VA (B)

220-17 **APPLIANCE LOADS** (VA Value from Nameplate)

Microwave 1500 VA X \_\_\_\_\_ . . . . . = \_\_\_\_\_ VA (8)

Compactor 1200 VA X \_\_\_\_\_ . . . . . = \_\_\_\_\_ VA (9)

Dishwasher 1200 VA X \_\_\_\_\_ . . . . . = \_\_\_\_\_ VA (10)

Disposal 800 VA X \_\_\_\_\_ . . . . . = \_\_\_\_\_ VA (11)

\_\_\_\_\_ VA X \_\_\_\_\_ . . . . . = \_\_\_\_\_ VA (12)

\_\_\_\_\_ VA X \_\_\_\_\_ . . . . . = \_\_\_\_\_ VA (13)

Appliance subtotal (Total lines 8-13) = \_\_\_\_\_ VA (14)

ADJUSTED APPLIANCE TOTAL = Sub Total (Line 14) \_\_\_\_\_ X \_\_\_\_\_ % . . . . = \_\_\_\_\_ VA (C)  
(Less than 4 units X 100%, 4 or more units X 75%)

220-18 **ELECTRIC DRYER** - 5000 VA or Nameplate (which ever is larger). . . . . = \_\_\_\_\_ VA (D)

220-3b **ELECTRIC WATER HEATER**(name plate value) . . . . . = \_\_\_\_\_ VA (E)

220-10b **LARGEST COOLER, A/C OR HEATING LOAD**

220-15 \_\_\_\_\_ VA (from name plate or use 9600 VA). . . . . = \_\_\_\_\_ VA (F)

220-21 \_\_\_\_\_ VA (from name plate or use 9600 VA). . . . . = \_\_\_\_\_ VA (F)

OTHER LOADS \_\_\_\_\_ VA (or \_\_\_\_\_ AMPS X 240 = VA) . . . . . = \_\_\_\_\_ VA (G)

OTHER LOADS \_\_\_\_\_ VA (or \_\_\_\_\_ AMPS X 240 = VA) . . . . . = \_\_\_\_\_ VA (H)

OTHER LOADS \_\_\_\_\_ VA (or \_\_\_\_\_ AMPS X 240 = VA) . . . . . = \_\_\_\_\_ VA (I)

**TOTAL VA {Total (A)+(B)+(C)+(D)+(E)+(F)+(G)+(H)+(I)}**. . . . . = \_\_\_\_\_ **TOTAL VA**

220-2 **MINIMUM SERVICE SIZE** =  $\frac{\text{TOTAL VA}}{240 \text{ VOLTS}} = \frac{\quad}{240} = \quad$  **AMPS**

Note: Error in these calculations as well as improper electrical installations can be hazardous. If in doubt, hire a licensed Electrical Contractor to do the work.



## RESIDENTIAL ELECTRICAL SERVICE SIZING

HELP FOR THE HOMEOWNER  
CITY OF FILLMORE, BUILDING AND SAFETY

Approved By: \_\_\_\_\_ Date  
Date: 4/9/03 Sheet 1 of 2 E-3

# RESIDENTIAL ELECTRICAL NOTES Based on the 2001 California Electrical Code

## REQUIRED BRANCH CIRCUITS

1. Small-Appliance Branch Circuits. Two or more 20-ampere small-appliance branch circuits shall be provided for all receptacles or outlets specified by Section 210-52(b). Section 210-11(c)1
2. Laundry Branch Circuits. At least one 20-ampere branch circuit shall be provided to supply the laundry receptacle outlet(s) required by Section 210-52(f). This circuit shall have no other outlets. Section 210-11(c)2
3. Bathroom Branch Circuits. At least one 20-ampere branch circuit shall be provided to supply the bathroom receptacle outlet(s). Such circuits shall have no other outlets. Section 210-11(c)3

## OTHER DEDICATED CIRCUITS TO CONSIDER

Type of Appliance	Typical Branch Circuit Rating	Volt Amperes For Calculations
1. Electrical range (240 V)	60 AMPS	13100 VA
2. Kitchen counter top small appliance branch circuit (120 V)	20 (15 Min) Amperes	1500 VA (2 Min.)
3. Counter-Mounted Electric Cooking Unit (240 V)	30 Amperes	14500 VA
4. Dishwasher (120 V)	15-20 Amperes	1200 VA
5. Garbage Disposal (120 V)	15 Amperes	800 VA
6. Wall-mounted electric oven (240 V)	30-40 Amperes	12000 VA
7. Electric clothes dryer (240 V)	30 Amperes	5000 VA
8. Washing machine or laundry area	20 Amperes	1500 VA
9. Microwave (120 V)	20 Amperes	1500 VA
10. Bathroom Electric Resistance Heaters (120 V)	20 Amperes	2400 VA
11. Electrical Wall Heaters	40 Amperes	9600 VA

Notes: Circuit rating shown here are typical and may vary. Always verify the nameplate rating of the actual unit and ensure the demand does not exceed the capacity of the circuit.

These loads may sometimes be combined with each other but total loads must be calculated and deratings must be applied. See NEC articles 220, 230, 424, 430, 440 and others for detailed requirements.

## Loads From Motors

Largest or single motor at  $1.25 \times \text{FLA} \times \text{Volts} = \text{VA}$

Total of Remaining Motors at  $1.00 \times \text{FLA} \times \text{Volts} = \text{VA}$

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Subtotal =  $\text{VA}$

(Can be entered in calculations in the "OTHER LOADS" Section)

Table 430-148 Full-Load Currents in Amperes Single-Phase Alternating-Current Motors

Single-Phase Alternating-Current Motors

HP	115V	230V
1/6	4.4	2.2
1/4	5.8	2.9
1/3	7.2	3.6
1/2	9.8	4.9
3/4	13.8	6.9
1	16.0	8.0
1-1/2	20.0	10.0
2	24.0	12.0

## Useful Information

AMPS X VOLTS = VA (Volt-Amps or Watts)

FLA = Full Load Amps



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