



CITY OF AUBURN | BUILDING DEPARTMENT

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2022 California Building Standards Code of Regulations Title 24

RESIDENTIAL ELECTRICAL LOAD WORKSHEET

Contractor Name _____ Project Address _____
Contractor License # _____

Method for determining the electrical load and sizing of the electrical service:

CEC Section: 220.82 "Optional Feeder and Service Load Calculations"

General light, power _____ SF x 3 volt-amperes = _____ volt-amperes
Kitchen appliance circuits (minimum 2 @ 1,500 volt-amperes) = _____ volt-amperes
Laundry circuits (minimum 1 @ 1,500 volt-amperes) = _____ volt-amperes
Electric range (NP rating) = _____ volt-amperes
Wall mounted oven (NP rating) = _____ volt-amperes
Water heater (NP rating) = _____ volt-amperes
Dishwasher (NP rating) = _____ volt-amperes
Disposal (NP rating) = _____ volt-amperes
Dryer (NP rating) = _____ volt-amperes
Other (examples: Permanently connected motors, appliances
fastened in place, electric vehicle charger) = _____ volt-amperes

Sub Total A (Add all loads listed above) = _____ volt-amperes
The first 10,000 volt-amperes is calculated at 100% = 10,000 volt-amperes
The remaining volt-amperes are calculated at 40% = _____ volt-amperes

Total A: Sub Total A _____ - 10,000 = _____ x .40 = _____ + 10,000 = _____ volt-amperes

Heating and Air-Conditioning (The Largest of the following shall be included):

1. Air conditioning and cooling (100% NP rating) = _____ volt-amperes
2. Heat pump without supplemental heating (100% NP rating) = _____ volt-amperes
3. Heat pump with supplemental electric heating (100% NP rating plus 65%) = _____ volt-amperes
4. Electrical space heating < 4 separate units (65% NP rating) = _____ volt-amperes
5. Electrical space heating ≥ 4 separate units (40% NP rating) = _____ volt-amperes
6. Electrical thermal storage and other (100% NP rating) = _____ volt-amperes
Total B: Largest Heating and Air Conditioning Load (From Above) = _____ volt-amperes

Calculate Total Service Load:

Total A _____ + **Total B** _____ ÷ 240 volts = _____ (amps size for service entrance conductors and panel)

Sample Residential Electrical Load Calculation – Step by Step Example (Optional Method)
CEC 220.82

2800 sq. ft. home
12 kW range
3 kW water heater
5 kW clothes dryer
1.5 kW dishwasher
6.96 kW air conditioning

Step 1:

Multiply the sq. ft. area by 3 VA per Sq. ft.
 $2800 \text{ sq. ft.} \times 3 \text{ VA} = 8,400 \text{ VA}$ (VA = volt-amperes)

Step 2:

Add in 1500 VA for each 2-wire, 20-amp small appliance branch circuit and each laundry circuit.
 $1,500 \text{ VA} \times 3 = 4,500 \text{ VA}$

Step 3:

Add in the appliance loads at nameplate value.

Range	12,000 VA
Water heater	3,000 VA
Clothes dryer	5,000 VA
Dishwasher	1,500 VA
EV Charger:	7,000 VA

Step 4:

Calculate general loads by adding steps 1, 2, and 3:

8,400 VA (Lighting)
4,500 VA (Small appliance/laundry circuits)
12,000 VA (Range)
3,000 VA (Water Heater)
5,000 VA (Dryer)
1,500 VA (Dishwasher)
7,000 VA (EV Charger)
Total= 41,400 VA

Step 5:

Take the first 10 kW at 100%. 10,000 VA
Take the remainder (31,400 VA) at 40%: $31,400 \text{ VA} \times .40 = 12,560 \text{ VA}$

Step 6:

Add the two values from step 5 together to find the general load.
 $10,000 \text{ VA} + 12,560 \text{ VA} = 22,560 \text{ VA}$

Step 7:

Identify the single largest load identified from Heating and Air-Conditioning Load (page 1:)

A/C load = 6.96 kW (From page 1, Total B)

Step 8:

Add the general load to the largest of the AC or heating load.

General Load: 22,560 VA (Step 6)

A/C Load: 6,960 VA (Step 7)

Total Service Load= $(22,560 + 6,960 = 29,520)$

Step 9:

Divide the load in VA by the voltage. $29,520 / 240 = 123A$

***Nameplate ratings provided in watts can be converted to volt-amperes at a rate of 1:1. (Assumed power factor of 1) Example: A nameplate rating of 1 kW= 1,000 VA**