



Building Permits & Inspection Division

General Information: (916) 875-5296
<https://building.saccounty.gov>

9700 Goethe Rd • Suite A Sacramento 95827 M-F 8:30am-4:00pm
827 7 th St • Room 102 Sacramento 95814 M-F 8:30am-4:00pm

EXISTING SINGLE FAMILY DWELLING ELECTRICAL LOAD CALCULATION

Contractor: _____

Site Address: _____

CEC Section 220.83 Panel size buss and main breaker= _____

General light/power	_____ SF x 3 volt-amperes	= _____ volt-amperes
(2) kitchen appliance circuits	@ 1,500 volt-amperes	= 3000 volt-amperes
Laundry circuits		= 1500 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 _____		= _____ volt-amperes
	Sub-Total	= _____ volt-amperes

Sub-Total	_____ volt-amperes		
	8000 volt-amperes	(First 8 kilo volt-amperes @ 100%)	= 8000 volt-amperes
Difference	_____ volt-amperes	(Remaining volt-amperes X 40%)	= _____ volt-amperes

Heating and Air Conditioning (the largest of the following shall be included):

Air conditioning and cooling	(100% NP rating)	= _____ volt-amperes
Heat pump without supplemental heating	(100% NP rating)	= _____ volt-amperes
Heat pump with supplemental electric heating	(100% NP rating)	= _____ volt-amperes
Electrical space heating < 4 separate units	(65% NP rating)	= _____ volt-amperes
Electrical space heating ≥ 4 separate units	(40%) NP rating)	= _____ volt-amperes
Electrical thermal storage and other	(100% NP rating)	= _____ volt-amperes

EV Chargers:

EV charger level 1	(100% NP rating)	= _____ volt-amperes
EV charger level 2	(100% NP rating)	= _____ volt-amperes
	Total	= _____ volt-amperes

Total volt-amperes _____ 240 volts = _____
(amp size for service entrance conductors and panel)

Single Family Dwelling Load Calculation – Step by Step Example (Optional Method) CEC 220.83

- 2800 sq. ft.
- 14 kW range
- 3 kW water heater
- 5 kW clothes dryer
- 1.5 kW dishwasher
- 15 kW central heat
- 29 amp, 240 volt air conditioning

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)

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

3. Add in the appliances loads at nameplate value.
 - Range 14,000 VA
 - Water heater 3,000 VA
 - Clothes dryer 5,000 VA
 - Dishwasher 1,500 VA

4. Add all appliance loads together = 36,400 VA Total

5. Take the first 8 kW at 100%. 8,000 VA
 Take the remainder (28,400 VA) at 40%. $28,400 \text{ VA} \times .40 = 11,360 \text{ VA}$

6. Add the two values from step 5 together to find the general load. $8,000 \text{ VA} + 11,360 \text{ VA} = 19,360 \text{ VA}$

7. Compare the heating load to the AC load and take the larger of the two loads. AC load at 100%. $29 \text{ amps} \times 240 \text{ volts} = 6,960 \text{ VA}$
 Heat load at 65%. $15,000 \text{ VA} \times .65 = 9,750 \text{ VA}$ (largest load).

8. Add the total load of EV chargers
 EV Charger 1 = 7,680 VA

9. Add the general load to the largest of the AC or heating load and add the EV chargers
 - General load = 19,360 VA
 - Heating load = 9,750 VA
 - EV Chargers = 7,680 VA
 - Total = 36,790 VA

Divide the load in VA by the voltage. $36,790 \text{ VA} \div 240 = 153 \text{ amps.}$