

Electrical Load Estimator

Instructions: Review the electrical loads in the table below and check all that exist in the home (be sure to include the proposed heat pump and other building electrification technologies that are being installed). Fill in the corresponding wattage for each item checked, and then add up all the checked items to determine total wattage used. Wattage shown are rough estimates: for a more precise analysis use actual values based on nameplate ratings or consult with an electrical professional. Please note that this form is a voluntary compliance alternative, and you may wish to hire a qualified individual or company to perform a thorough evaluation of your electrical service capacity in lieu of this methodology. Use this electrical load calculation worksheet is at the user's risk and carries no implied guarantee of accuracy. Users of this form are advised to seek professional assistance in determining the electrical capacity of a service panel.

Residential Electrical Load Estimation Example for a Single-Family Dwelling

Guidance consistent with California Electric Code 220.82

Given:

- Square foot area of home = 1,700 square feet (sf)
- 1.5 kW (1,500 watts) dishwasher
- 10kW range
- 15 kW central heat
- 4 kW water heater
- 29-amp, 240-volt air conditioning
- 4 kW clothes dryer
- VA = Volt-amperes

Instructions:

1. Multiply the ft² area by $3 \frac{VA}{ft^2}$
 - a. Ex: $5100 \frac{VA}{ft^2} = 1700 ft^2 * 3 VA$
2. Add 1,500 VA for each 2-wire, 20-amp small appliance branch circuit plus the laundry circuit (1,500 VA x 3 = 4,500 VA)
3. Add in the appliance loads at nameplate value or given on table (whichever is greater). Range 10,000 VA, Water heater 4,000 VA, Clothes dryer 4,000 VA, Dishwasher 1,500 VA
4. Add all appliance loads together: $5,100 + 4,500 + 10,000 + 4,000 + 4,000 + 1,500 = 29,100 VA$
5. Subtract 10,000 VA from the total VA (this will be added back in later): $29,100 - 10,000 = 19,100 VA$
6. Multiply the remainder of 19,100 VA by 40%.
 - a. $19,100x * 40\% = 7,640 VA$
7. Add the 10,000 VA value back from step 5 and the 7,640 VA from step 6 together to find the general load.
 - a. $10,000 + 7,640 = 17,640 VA$
8. Compare the heating load to the AC load and take the larger of the two loads:
 - a. AC load at 100%: $29 \text{ amps} * 240 \text{ volts} = 6,960 VA$
 - b. Heat load at 65%: $15,000VA * .65 = 9,750 VA$ (larger load)
9. Add the general load to the largest of the AC or heating load:
 - a. *General load 17,640 VA + Heating load 9,750 VA = Total load 27,390 VA*
10. Divide the total load in VA by the voltage
 - a. $\frac{27,390 VA}{240 V} = 114 A$
11. Add 40 amps for future Photovoltaic System (Roof Solar Panels).
 - a. $114 A + 40 A = 154 A$ (minimum panel capacity)

Check All Applicable	Description of Load	Volt-Amps on Nameplate Rating	Watts Volt-Amps Used (Fill all Applicable)
General Lighting/Power Load			
<i>Required</i>	Total sq. footage of building x 3	3 volt-amps/sf	
<i>Required</i>	Kitchen Small Applicant Branch Circuits (minimum of 2)	1,500 volt-amps/circuit	
<i>Required</i>	Laundry Circuit (minimum of 1)	1,500 Volt - Amps	
Appliances and Equipment Except Air Conditioner(s)			
	Microwave	1,400 watts	
	Trash Compactor	1,000 watts	
	Dishwasher	1,500 watts	
	Disposal	1,000 watts	
	Electric Oven	2,000 watts	
	Electric Range	5,000 watts	
	Induction Range	10,000 watts	
	Electric Clothes Dryer	4,000 watts	
	Electric Clothes Washer	500 watts	
	Electric Tankless Water Heater	15,000 watts	
	Electric Water Heater	4,000 watts	
	Electric Heat Pump Water Heater	550 watts	
<i>Required on new homes</i>	Electric Vehicle Supply Equipment (EVSE)	7,000 watts	
	Evaporative Cooler	500 watts	
	Pool or Spa	2,000 watts	
	Other		
	Other		
	Other		
Sub-Total Volt Amps Used (add up V-A used for everything checked)			
			-10,000 V-A
		Subtotal (A)	
			x .40
		Subtotal (B)	
			+ 10,000 V-A
		Subtotal (C)	

Heating and Air-Conditioning (Include the largest of the following)		+
1. Air conditioning and cooling (100% of nameplate (NP) rating) =		
2. Heat pump without supplemental heating (100% NP Rating) =		
3. Heat pump with supplemental electric heat (100% NP plus 65%) =		
4. Electrical space heating, 4 separate units (65% NP Rating) =		
5. Electrical space heating > 4 separate units (40% NP Rating) =		
6. Electrical thermal storage and other 100% NP Rating =		
Total Current Demand (Volt-Amps) =		
Divided by 240 Volts =		Amps
40 Amp Back-feed protection for future Photovoltaic System (Solar Panels)		+40 Amps
Total Amps required for Service Conductors and Panel =		
Rating of Existing/Proposed Electrical Service or Subpanel (Amps) =		
Panel Upgrade Required? (Circle one)		Yes No

Statement of Compliance:

By my signature, I attest that the information provided above is true and accurate.

Name of Applicant: _____ Signature of Applicant: _____

Project Address: _____ Date: _____