

Supporting Documentation for Electric Readiness Equivalencies

The table below summarizes the electrical power equivalencies of the following gas equipment:

- [Domestic Hot Water \(DHW\) Heaters](#)
- [Space Heaters](#)
- [Clothes Dryers](#)
- [Cooking Equipment](#)
- [Pool and Spa Heaters](#)

Table 1: Summary of Electric Readiness Equivalencies							
Type	End Use	Voltage	Breaker amps	Appliance Load (amps at 240 V)	Coefficient of Performance (COP)	kVA required per 10kBtu	Notes
Appliances serving individual units							
	DHW	240	30	24			
	Space Heat	240	30	24			
	Clothes dryer	240	30	24			
	Oven Only	240	20	16			
	Cooktop Only	240	40	32			
	Inductive Range	240	40	32			
Engineered Systems serving multiple units							
	DHW				2.50	1.17	
	Space Heat				na	na	Varies by climate
	Combined DHW / Space Heat				na	na	Varies by climate
	Clothes dryer				3.50	0.84	
	Pools/Spas				4.00	0.73	

- Data were obtained from the CEC appliance database (MAEdbs), manufacturers specs and a published study (for pools).
- Note, the "Appliance Load" and "kVA Required" columns represent current, not breaker capacity.
- kVA equivalency was derived by converting Btus to kWh (divide by 3,412) and dividing the result by the coefficient of performance (the hour cancels out).

Water Heating

Table 2: Circuits for Water Heaters Serving Individual Units

Model	Capacity (gal)	Uniform Energy Factor (UEF)	Breaker Amps at 240V	Max amps at 240V (+15% for breaker size)
AO Smith Voltex	50-80	3.35-3.45	30	
Rheem Prestige	50-80	3.55-3.7	30	
Ruud Ultra	50-80	3.55-3.7	30	
Energy Star Average				20.83
Recommended			30	

Table 3: COPs for Engineered Systems: Based on COPs for Stand-alone Appliances

	COP	Avg UEF	Min. UEF	Avg EF/COP per RESNET calculator	Min EF/COP per RESNET calculator	Notes
Energy Star database		3.25	2.3	3.33	2.18	
CEC Average (of EF >2)	2.89					Of 842 appliances approved by CEC.
Inferred COP (see below)	2.54					
Recommended	2.5					

Table 4: Inferred COP based on CA Code Requirement for DHW Gas Line Capacity

A	B	C	D	E	F	G	H	I	J
Size	Btu/h - Code Min	Gas COP	kBtu/h Output	Voltage	HP Breaker amps	Max Current	kVA input	kBtu input	Inferred COP
SF (50 gal)	50,000	0.8	40	240	30	24	4.61	15.72	2.54

Column	Label	Description
A	Appliance size for residential occupancy	
B	Btu/h - Code Min	Btu/h Code minimums per 2106 CA Plumbing Code, Section 1208.4.2
C	Gas COP	Typical gas appliance energy factor/COP
D	kBtu/h Output	Net output gas appliance
E	Voltage Specs for common HP appliances	
F	HP breaker amps	Specs for common HP appliances
G	Max current	amps/1.25
H	kVA input	kW
I	kBtu input	kW * 3.412
J	Inferred COP	Gas output/elec input

Space Heating

Table 5: Circuits for Space Heating Systems Serving Individual Units

Source	Breaker Amps at 240V	Notes
CEC appliance database	30	20,111 units available at 240v/30 amps, up to 62,000 Btu/h
Common appliances	20-50	See list of appliances below
Recommended	30	

Table 6: Common Equipment Requirements

Brand	Model	Capacity (Btu/hr)	Breaker Amps at 240V	Circuit Amps
Trane XB13	4TWB3018A1	18000	15	
Trane XB13	4TWB3024A1	24000	20	
Trane XB13	4TWB3030A1	30000	25	
Trane XB13	4TWB3036A1	36000	35	
Trane XB13	4TWB3042A1	42000	40	
Trane XB13	4TWB3048A1	48000	50	
Trane XB13	4TWB3060A1	60000	60	
Trane XL20i	4TWZ0024A1	24000	20	
Trane XL20i	4TWZ0048A1	48000	40	
Trane XL20i	4TWZ0060A1	60000	60	
Trane XR13	2TWR3018A1	18000	15	
Trane XR13	2TWR3024A1	24000	20	
Trane XR13	2TWR3030A1	30000	20	
Trane XR13	2TWR3036A1	36000	30	
Carrier	25HCB6	24000	30	
Carrier	25HCB6	36000	35	
Carrier	25HCB6	48000	50	
Carrier	25HCB6	60000	60	
Carrier	25HNB9	36000	40	
Carrier	25HNB9	48000	50	
Carrier	25HNB9	60000	60	
Lennox	N4H448GKG	48000	40	25.2
Lennox	N4H4xxGKG	18000	20	11.8
Lennox	N4H4xxGKG	60000	50	32

Clothes Dryers

Table 7: Clothes Dryers		
Circuits for Individual Units	Breaker Amps at 240V	
Samsung - DV22N685*H*	240v, 30 amp	
Blomberg - DHP24412W	240v, 30 amp	
Whirlpool - WHD862CH**	240v, 30 amp	
Asko - T208H.W.U	240v, 30 amp	
Recommended	240v, 30 amp	
COP for Commercial Dryers/ Engineered Systems	Combined Energy Factor	Notes
Average CEC Energy Factor	3.57	Database of CEC approved appliances
Recommended	3.5	

Note, combined dryer/hot water systems can achieve higher COPs.

Cooking Equipment

Table 8: Cooking Equipment		
Type	Model	Breaker Amps at 240V
Cooktops		
	FGIC3066TB	30-40
	PHP9030DJBB	40
	NZ30K7880US	45
	MVIC6304BBG	40
	Recommended	40
Wall Ovens		
	Amana AWO6313SFS	20
	Bosch 800 Series HBL8451UC	30
	Café CT9070SHSS	20
	EI30EW38TS	20
	Frigidaire Professional FPEW3077RF	20
	Recommended	20
Ranges		
	Frigidaire Gallery FGIF3036TF	40
	GE Profile PHS930SLSS	40
	Kenmore Elite 95073	40
	LG LSE4616ST	50
	Samsung NE58K9560WS/AA	40
	Recommended	40

Pool and Spa Heating

- Recommend COP of 4.0, based on Energy Solutions study for Santa Monica
<http://santamonicacityca.igms2.com/Citizens/FileOpen.aspx?Type=4&ID=8519&MeetingID=1192>
- 4.0 is the average for CEC-approved units at 50 F.
- Assumes pools are used during swim season, not cold weather.
- Lower COP for cold weather applications will significantly increase electrical capacity.
- Ramp up limited at this COP.
- Alternate solution for such applications is hybrid (nascent market may grow to fill demand) or dual system.