



AGRICULTURAL ENGINEERING FACT SHEET
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Energy Requirements of Electrical Equipment

Each year the average bill for electrical energy seems to increase. The following table shows the energy requirements of individual pieces of equipment and how they contribute to the total electric bill.

The figures represent average consumption for a family of four or five under normal conditions.

Table Notes

The capacities of air conditioning systems commonly are given in tons but sometimes are given in Btu's per hour. One ton of air conditioning capacity is equal to 12,000 Btu's per hour. Thus, a 3-ton air conditioning system would have a capacity of 36,000 Btu's per hour. The motor size for an air conditioning system can be estimated very closely on the basis of 1 horsepower for every ton of capacity.

Electric motors of ½ horsepower or larger should be operated on 240 volts. Single phase motors usually are limited to 7½-10 horsepower. Three phase motors generally are used for applications requiring more than 7½-10 horsepower. These motors need special electric service, either three phase power or a phase converter on single phase power.

FOR THE HOME		
Appliance	Approximate wattage	Average kw.-hr./mo.*
Air conditioning (central)	2-4 tons	2,000-4,000 per season
Air conditioning (window)	½-2 tons	800-2,000 per season
Blanket, electric	100-200	10-20
Broiler	1,300-1,600	7-10
Can opener	175	1-2 per year
Cleaner, air electronic	40	10-25
Clock	3-10	2-8
Clothes drier (electric)	4,500-6,000	50-100
Clothes drier (gas)	200	4-8
Coffeemaker	600-1,000	3-10
Cooling, attic fan	1/6-1/2 hp.	40-80
Dehumidifier	200-600	100-400
Dishwasher	1,000-1,600	30-45
Electric slow cookers	125-250	0.15-0.25 per hour of use
Fan, portable	50-200	5-20
Floor polisher	200-400	1
Food blender	200-300	½-1
Food grinder	300-500	1
Food waste disposer	400	1-2
Freezer, food (5-30 cu. ft.)	300-800	75-200
Frypan	1,000-1,500	10-20
Furnace, gas	300-750	75-250
Furnace, oil	500-1,000	100-300
Griddle, electric	1,000-1,500	10
Hair drier	200-1,200	¾-3 per person
Heater, portable	600-1,500	0.6-1.5 per hour
Heating pad	50-150	0.05-0.15 per hour
Hot plate	500-1,650	10-30
House heating	10 per sq. ft. floor area heated	12-15 per season per sq. ft. floor area heated
Humidifier, furnace	10-200	2-30
Humidifier, portable	150-300	25-50

Appliance	Approximate wattage or hp.	Average kw.-hr./mo.*
Iron, hand (steam or dry)	1,000-1,500	12
Knife, electric carving	100	½-1
Knife sharpener	125	¼
Lighting, small home	1,600	varies widely 75-125
Lighting, large home	4,000	150-250
Microwave oven	1,200-1,600	20-50
Mixer, food	100-350	1
Pasteurizer, ½ gal.	1,500	1.5 per hour
Projector, movie	300-750	0.3-0.75 per hour
Projector, slide	250-750	0.25-0.75 per hour
Radio, table	5-20	2-5
Range	8,500-16,000	100-150
Record player, hi-fi, stereo	30-100	1-5
Refrigerator	250-500	50-100
Sewing machine	50-100	1-2
Shaver	12	1/10
Sunlamp	250-500	0.25-0.5 per hour
Television, black and white	25-75	3-12
Television, color	150-200	20-50
Toaster, two-slice	800-1,200	3-5
Toaster, four-slice	1,600-1,800	4-6
Vacuum cleaner	300-1,000	2-5
Waffle iron	550-1,300	1-2
Washer, automatic	300,700	3-8
Water heater, standard	1,600-4,500	200-400
Water heater, quick recovery	7,400-11,000	200-400
Water pump (deep)	1/3-1 hp.	10-60
Water pump (shallow)	¼ hp.	5-20

*Unless otherwise specified.

FARMSTEAD OPERATIONS		
Equipment	Capacity hp. or watts	Estimated kw.-hr.
Barn cleaner	2-5 hp.	25-40 per mo.
Brooder (hogs)	250 watts	1 per 4 hr.
Electric fence	7-10 watts	7 per mo.
Feed grinder (grinder blender)	2-7½ hp.	3-7 per ton
Feed mixer	1-7½ hp.	1 per ton
Grain drier (heated air)	5-40 hp.	15-40 per 100 bu.
Grain drier (natural air or supplemental heat)	3-7½ hp.	50-150 per 100 bu.
Grain elevator (auger)	½-7½ hp.	2-4 per 1,000 bu.
Grain elevator (bucket)	½-7½ hp.	1-2 per 1,000 bu.
Milk cooler, bulk	½-5 hp.	1 per 100 lb. milk
Milkhouse space heater	1,000-3,000 watts	800 per yr.
Milkers, portable	1-3 hp.	2-3 per cow per mo.
Milkers, pipeline	2-6 hp.	4-6 per cow per mo.
Silage conveyer	1½-5 hp.	¼-½ per ton
Silo unloader	5-7½ hp.	2-5 per ton
Stock tank heater	250-1,500 watts	90-500 per mo.
Ventilation fans (dairy) winter	1/6-1/2 hp.	5-7 per mo. per 1,000 lb. animal weight
Ventilation fans (dairy) summer	1/6-1/2 hp.	10-15 per mo. per 1,000 lb. animal weight
Ventilation fans (hogs) winter	1/8-1/2 hp.	7-10 per mo. per 1,000 lb. animal weight
Ventilation fans (hogs) summer	1/8-1/2 hp.	14-20 per mo. per 1,000 lb. animal weight

Equipment	Capacity hp. or watts	Estimated kw.-hr.
Ventilation (milkhouse)	100-200 watts	1-5 per mo.
Water heater (milkhouse)	1,000-5,000 watts	1 per 4 gal. of water
Yard light	100-500 watts	10-50 per mo.
Yard light (automatic)	175-450 watts	60-150 per mo.

FOR THE SHOP

Equipment	Capacity hp., watts, or amperes	Estimated kw.-hr.
Air compressor	¼-½ hp.	1 per 3 hr.
Arc welder	37½ amp.	100 per yr.
Battery charger	600-750 watts	2 per battery charge
Concrete mixer	½-2 hp.	1 per cu. yrd.
Drill press	1/6-1 hp.	½ per hr.
Fan, 10-inch	100 watts	1 per 10 hr.
Grinder, emery wheel	1/4-1/3 hp.	1 per 3 hr.
Heater, engine	300-1,000 watts	1 per 3 hr.
Heater, portable	1,000-3,000 watts	1-3 per hr.
Lathe, metal	¼-1 hp.	1 per 2 hr.
Lathe, wood	¼-1 hp.	1 per 2 hr.
Lighting	50-300 watts	4 per mo.
Saw, circular 8-inch to 10-inch	1/3-1/2 hp.	1 per 2 hr.
Saw, jig	1/4-1/3 hp.	1 per 3 hr.
Soldering iron	60-500 watts	1 per 5 hr.

MISCELLANEOUS

Equipment	Capacity hp. or watts	Estimated kw.-hr.
Small motors	½-5 hp.	1 per hp. per hr.
Insect trap	25-40 watt black light lamp	1/3 per night
Snow melting, sidewalk and steps, heating cable imbedded in concrete	25 watts per sq. ft.	2½ per 100 sq. ft. per hr.
Soil heater, hotbed	400 watts	1 per day per season

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