Conversion Chart – Power

A **boiler horsepower** is used for boilers in power plants. It is equal to 33,475 Btu/h (9.8095 kW), which is the energy rate needed to evaporate 34.5 lb (15.65 kg) of water at 212 degrees Fahrenheit (100 degrees Celsius) in an hour.

The **electrical horsepower** is used by the electrical industry for electric motors and is defined to be exactly 746 watts (at 100% efficiency).

1 ton = 12000 Btu/Hr = 3517.2 Watts = 4.713048 HP.

GPM = $\dfrac{\text{BTU/HR}}{500 \text{ (water) X temp diff deg F}}$,   1 psig = 2.31 Feet Total Dynamic Head

TABLES OF MEASUREMENT	
The British thermal unit (Btu) or the kilogram-Calorie (Cal) were originally defined as the heat required to raise the temperature of 1 pound or 1 kilogram of water by 1°F or 1°C, respectively. Recently the International Calorie has been defined as 1/860 International kilowatthour. The Btu is derived from the International Calorie from the relation 1 Cal per kg = 1.8 Btu per lb. The differences are less than 0.05 of 1% and are, therefore, for the purposes of these tables, negligible	

1 British thermal unit [Btu]	= 778.26 foot-pounds (778) = 107.6 kilogram-meters = 0.2520 Calorie	1 kilowatt [kw]	= 738 foot-pounds/sec = 102 kilogram-meters/sec = 1.341 horsepower = 1.360 metric horsepower
1 Btu per lb.	= 0.556 Calorie per kg.	1 horsepower [hp]	= 33,000 foot-pounds/min = 550 foot-pounds/sec = 76.04 kilogram-meters/sec = 0.746 kilowatt = 1.014 metric horsepower
1 Btu per cu. ft.	= 8.90 Cal per cu meter		
1 Btu per sq. ft.	= 2.712 Cal per sq meter		
1 Btu per sq. ft., °F	= 4.88 Cal per sq m, °C		
1 Btu/hr., sq. ft, °F/ft	= 1.488 Cal/hr., sq. m, °C/m	1 kilowatthour [kwhr]	= 3412.75 Btu (3413) = 860 Calories
1 Btu/hr, sq. ft, °F/in	= 0.1240 Cal/hr, sq m, °C/m	1 horsepower-hour	= 2,545 1 Btu (2545)
1 therm	= 100,000 Btu	1 boiler horsepower	=10 ft² of boiler heating surface = 34.5 lb per hour evaporation from and at 212°F = 33476 Btu/h
1 Calorie [Cal]	= 3,088 foot-pounds = 427 kilogram-meters = 3.968 Btu		
Steam Radiation Lbs. Condensate/hr.	= $\dfrac{\text{Sq. Ft. E.D.R.}}{4}$	100% boiler rating	= 3,348 Btu (ie, 3.45 lb. evaporation from & at 212°F) per sq ft heating surface/hour
Heating Water with Steam (Exchangers) Lbs. Condensate/hr.	= $\dfrac{\text{GPMx(1.1)xTempRiseF}}{2}$	An approximate cost of an installed hydronic radiant floor heating system by a licensed mechanical contractor can range from $600 to $800 per approximately 100 square feet. This cost can be more or less depending on specific heating requirements and energy efficiency results. www.systecoreinc.com	
Heating air with steam coils Lbs. Condensate/hr.	= $\dfrac{\text{CFM}}{800}$ x Temp Rise F		