

## Conversion Factors

SHARING

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Some useful numbers to help get you from here to there:

Multiply	By	To Obtain
Atmosphere	29.92	Inches of mercury
Atmosphere	33.92	Feet of water
Atmosphere	14.7	Pounds per square inch
Atmosphere	1.058	Tons per square foot
Barrels (oil)	42	Gallons
Boiler Horsepower	33,474	Btu per hour
Boiler Horsepower	34.5	Pounds water evaporated from and at 212F
BTU	778	Foot-Pounds
BTU	0.000393	Horsepower-hours
BTU	0.000293	Kilowatts-hours
BTU	0.0010307	Pounds water evaporated from and at 212F
BTU per 24 hr	0.00000347	Tons of refrigeration
BTU per hour	0.00002986	Boiler horsepower
BTU per hour	0.000393	Horsepower
BTU per hour	0.000293	Kilowatts
BTU per inch per sq. ft. per hour per F	0.0833	Btu per foot per sq. ft. per hour per F
Cubic feet	1,728	Cubic Inches
Cubic feet	7.48052	Gallons
Cubic feet of water	62.37	Pounds at (at 60F)
Cubic feet per minute	0.1247	Gallons per second
Feet of water	0.881	Inches of mercury (at 32F)
Feet of water	62.37	Pounds per square foot
Feet of water	0.4335	Pounds per square inch
Feet of water	0.0295	Atmospheres
Feet per minute	0.01136	Miles per hour
Feet per minute	0.01667	Feet per second

Foot-pounds	0.001286	Btu
Gallons (U.S.)	0.1337	Cubic feet
Gallons (U.S.)	231	Cubic inches
Gallons of water	8.3453	Pounds of water (at 60F)
Horsepower	550	Foot pounds per sec
Horsepower	33,000	Foot-pounds per min
Horsepower	2,546	BTU per hour
Horsepower	42.42	BTU per minute
Horsepower	0.7457	Kilowatts
Horsepower (boiler)	33,475	BTU per hour
Inches of mercury (at 62F)	13.57	In. of water (at 62F)
Inches of mercury (at 62F)	1.131	Ft. of water (at 62F)
Inches of mercury (at 62F)	0.4912	Pounds per sq in.
Inches of mercury (at 62F)	70.73	Pounds per sq ft.
Inches of water (at 62F)	0.07355	Inches of mercury
Inches of water (at 62F)	0.03613	Pounds per sq in.
Inches of water (at 62F)	5.202	Pounds per sq ft.
Inches of water (at 62F)	0.002458	Atmospheres
Kilowatts	56.92	BTU per minute
Kilowatts	1.341	Horsepower
Kilowatts-hours	3,415	BTU
Latent heat of ice	143.33	BTU per pound
Pounds	7,000	Grains
Pounds of water at 60F	0.01602	Cubic Feet
Pounds of water at 60F	27.68	Cubic Inches
Pounds of water at 60F	0.1198	Gallons
Pounds of water evaporated from and at 212F	0.284	Kilowatt-hours
Pounds of water evaporated from and at 212F	0.381	Horsepower-hours
Pounds of water evaporated from and at 212F	970.4	BTU
Pounds per square inch	2.309	Ft. of water (at 62F)
Pounds per square inch	2.0416	In. of mercury (at 62F)
Tons of refrigeration	12,000	BTU per hour
Tons of refrigeration	200	BTU per minute
Tons (Long)	2,240	Pounds
Tons (Short)	2,000	Pounds
Watts	44.26	Ft. pounds per min
Watts	0.7378	Ft. pounds per sec
Watts	0.05692	BTU per minute
Watt-hours	3.415	BTU
Watt-hours	2,656	Ft. pounds

EDR to Pounds of condensate per hour (Divide EDR by 4) • EDR to GPM (Multiply EDR by 0.0005)

EDR to BTUH at 1 psig steam pressure (Multiply EDR by 240) • EDR to boiler horsepower (Divide EDR by 140)

EDR to Grate Area in Square Feet (Divide EDR by 196) • BTUH to EDR (Divide BTUH by 240)

BTUH to Boiler Horsepower (Divide BTUH by 33,475) • PSIG to Feet of Water (Multiply PSIG by 2.31)

Boiler Horsepower to Pounds of Condensate per hour (Multiply BHP by 34.5) • Boiler steaming rate (regardless of type or manufacturer) = 1/2 GPM per 1,000 sq. ft. EDR

<b>Fuel Values:</b>	<b>Maximum copper tubing flow rates and BTUH loads (at 20° Δ T)</b>
No. 1 fuel oil = 135,000 BTU per gallon	1/2" = 1-1/2 GPM = 15,000 BTUH
No. 2 fuel oil = 140,000 BTU per gallon	3/4" = 4 GPM = 40,000 BTUH
No. 4 fuel oil = 155,000 BTU per gallon	1" = 8 GPM = 80,000 BTUH
No. 5 fuel oil = 150,000 BTU per gallon	1-1/4" 14 GPM = 140,000 BTUH
No. 6 fuel oil = 153,000 BTU per gallon	1-1/2" = 22 GPM = 220,000 BTUH
Natural gas = 1,000 BTU per cubic foot	2" = 45 GPM = 450,000 BTUH
Natural gas = 100,000 BTU per Therm	
Manufactured gas = 550 BTU per cubic foot	
Propane = 2,250 BTU per cubic foot	Fahrenheit to Celsius = (°F - 32°) / 1.8
Propane = 92,000 BTU per gallon	Celsius to Fahrenheit = °C x 1.8 + 32°
Electricity = 3,415 BTU per kWh	
Anthracite coal = 13,700 BTU per pound	Stream Fan Coil loads in Pounds of Steam per hour =
Bituminous coal = 12,500 BTU per pound	CFM X ΔT of air (in °F) / 800
Wood = 14,000,000 BTU per mixed cord	

**EDR FOR HOT WATER RADIATORS:**

<i>Average water temp °F</i>	<i>Output in BTUH per sq ft. EDR</i>
150	110
155	120
160	130
165	140
170	150
175	160
180	170
185	180
190	190
195	200
200	210
205	220
210	230
215*	240
220	250

\*(also for 1 psi steam)

**Pump Head Rule of Thumb:**

Measure longest run in feet. Allow 6 feet of pump head per 100 feet (this includes an allowance for the fittings and the boiler)