# CONVERSION FACTORS

| MULTIPLY | BY | TO OBTAIN |
|---|---|---|
| **Atmospheres (Std.)** 760 MM of Mercury at 32°F. | 14.696 | Lbs./sq. inch |
| **Atmospheres** | 76.0 | Cms. of mercury |
| Atmospheres | 29.92 | In. of mercury |
| Atmospheres | 33.90 | Feet of water |
| Atmospheres | 1.0333 | Kgs./sq. cm. |
| Atmospheres | 14.70 | Lbs./sq. inch |
| Atmospheres | 1.058 | Tons/sq. ft. |
| **Brit. Therm. Units** | 0.2520 | Kilogram-calories |
| Brit. Therm. Units | 777.5 | Foot-lbs. |
| Brit. Therm. Units | 0.000393 | Horse-power-hrs. |
| Brit. Therm. Units | 0.293 | Watt-hrs. |
| **BTU/min.** | 12.96 | Foot-lbs./sec. |
| BTU/min. | 0.02356 | Horse-power |
| BTU/min. | 0.01757 | Kilowatts |
| BTU/min. | 17.57 | Watts |
| **Calorie** | 0.003968 | BTU |
| **Centimeters** | 0.3973 | Inches |
| Centimeters | 0.03280 | Feet |
| Centimeters | 0.01 | Meters |
| Centimeters | 10 | Millimeters |
| **Centimeters of Merc.** | 0.01316 | Atmospheres |
| Centimeters of Merc. | 0.4461 | Feet of water |
| Centimeters of Merc. | 136.0 | Kgs./sq. meter |
| Centimeters of Merc. | 27.85 | Lbs./sq. ft. |
| Centimeters of Merc. | 0.1934 | Lbs./sq. inch |
| **Cubic feet** | 2.832x104 | Cubic cms. |
| Cubic feet | 1728 | Cubic inches |
| Cubic feet | 0.02832 | Cubic meters |
| Cubic feet | 0.03704 | Cubic yards |
| Cubic feet | 7.48052 | Gallons U.S. |
| **Cubic feet/minute** | 472.0 | Cubic cms./sec. |
| Cubic feet/minute | 0.1247 | Gallons/sec. |
| **Cubic foot water** | 62.4 | Pounds @ 60°F. |
| **Feet** | 30.48 | Centimeters |
| Feet | 12 | Inches |
| Feet | 0.3048 | Meters |
| Feet | 1/3 | Yards |

| MULTIPLY | BY | TO OBTAIN |
|---|---|---|
| **Feet of water** | 0.02950 | Atmosphere |
| Feet of water | 0.8826 | Inches of mercury |
| Feet of water | 0.03048 | Kgs./sq. cm. |
| Feet of water | 62.43 | Lbs./sq. ft. |
| Feet of water | 0.4335 | Lbs./sq. inch |
| **Feet/min.** | 0.5080 | Centimeters/sec. |
| Feet/min. | 0.01667 | Feet/sec. |
| Feet/min. | 0.01829 | Kilometers/hr. |
| Feet/min. | 0.3048 | Meters/min. |
| Feet/min. | 0.01136 | Miles/hr. |
| **Foot-pounds** | 0.001286 | BTU |
| **Gallons** | 3785 | Cu. centimeters |
| Gallons | 0.1337 | Cubic feet |
| Gallons | 231 | Cubic inches |
| Gallons | 128 | Fluid ounces |
| Gallons | 3.785 | Liters |
| **Gallons water** | 8.35 | Lbs. water @60°F. |
| **Horse-power** | 42.44 | BTU/min. |
| Horse-power | 33,000 | Foot-lbs./min. |
| Horse-power | 550 | Foot-lbs./sec. |
| Horse-power | 0.7457 | Kilowatts |
| Horse-power | 745.7 | Watts |
| **Horse-power (boiler)** | 33,479 | BTU/hr. |
| Horse-power (boiler) | 9.803 | Kilowatts |
| **Horse-power-hours** | 2547 | BTU |
| Horse-power-hours | 0.7457 | Kilowatt-hour |
| **Inches** | 2,540 | Centimeters |
| Inches | 25.4 | Millimeters |
| Inches | 0.0254 | Meters |
| Inches | 0.0833 | Foot |
| **Inches of mercury** | 0.03342 | Atmospheres |
| Inches of mercury | 1.133 | Feet of water |
| Inches of mercury | 13.57 | Inches of water |
| Inches of mercury | 70.73 | Lbs./sq. ft. |
| Inches of mercury | 0.4912 | Lbs./sq. inch |
| **Inches of water** | 0.002458 | Atmospheres |
| Inches of water | 0.07355 | In. of mercury |
| Inches of water | 0.5781 | Ounces/sq. inch |
| Inches of water | 5.202 | Lbs./sq. foot |
| Inches of water | 0.03613 | Lbs./sq. inch |
| **Kilowatts** | 56.92 | BTU/min. |
| Kilowatts | 1.341 | Horse-power |
| Kilowatts | 1000 | Watts |
| Kilowatt-hours | 3415 | BTU |

| MULTIPLY | BY | TO OBTAIN |
|---|---|---|
| **Liters** | 0.2642 | Gallons |
| Liters | 2.113 | Pints (liq.) |
| Liters | 1.057 | Quarts (liq.) |
| **Meters** | 100 | Centimeters |
| Meters | 3.281 | Feet |
| Meters | 39.37 | Inches |
| Meters | 1000 | Millimeters |
| Meters | 1.094 | Yards |
| **Ounces (fluid)** | 1.805 | Cubic inches |
| Ounces (fluid) | 0.02957 | Liters |
| **Ounces/sq. inch** | 0.0625 | Lbs./sq. inch |
| Ounces/sq. inch | 1.73 | Inches of water |
| **Pints** | 0.4732 | Liter |
| **Pounds (avoir.)** | 16 | Ounces |
| **Pounds of water** | 0.01602 | Cubic feet |
| Pounds of water | 27.68 | Cubic inches |
| Pounds of water | 0.1198 | Gallons |
| **Pounds/sq. foot** | 0.01602 | Feet of water |
| Pounds/sq. foot | 0.006945 | Pounds/sq. inch |
| **Pounds/sq. inch** | 0.06804 | Atmospheres |
| Pounds/sq. inch | 2.307 | Feet of water |
| Pounds/sq. inch | 2.036 | In. of mercury |
| Pounds/sq. inch | 27.68 | Inches of water |
| **Temp. (°C.)+273** | 1 | Abs. temp. (°C.) |
| Temp. (°C.)+17.78 | 1.8 | Temp. (°F.) |
| Temp. (°F.)+460 | 1 | Abs. temp. (°F.) |
| Temp. (°F.)–32 | 5/9 | Temp. (°C.) |
| **Therm** | 100,000 | BTU |
| Tons (long) | 2240 | Pounds |
| **Ton, Refrigeration** | 12,000 | BTU/hr. |
| **Tons (short)** | 2000 | Pounds |
| **Watts** | 3.415 | BTU |
| Watts | 0.05692 | BTU/min. |
| Watts | 44.26 | Foot-pounds/min. |
| Watts | 0.7376 | Foot-pounds/sec. |
| Watts | 0.001341 | Horse-power |
| Watts | 0.001 | Kilowatts |
| **Watt-hours** | 3.415 | BTU/hr. |
| Watt-hours | 2655 | Foot-pounds |
| Watt-hours | 0.001341 | Horse-power hrs. |
| Watt-hours | 0.001 | Kilowatt-hours |

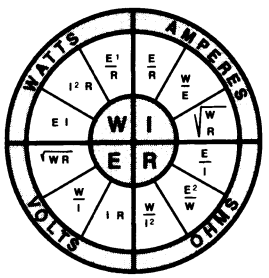
## BTU & ORIFICE SIZE GUIDE

| BTU INPUT | DRILL SIZES NATURAL GAS 3" W.C. | 3.5" W.C. | 4" W.C. | 4.5" W.C. | L.P. GAS 7" W.C. | 11" W.C. |
|---|---|---|---|---|---|---|
| 10,000 | 51 | 52 | 1/16 | 53 | 54 | 62 |
| **12,000** | 50 | 50 | 51 | 51 | 53 | 59 |
| 14,000 | 48 | 49 | 50 | 50 | 52 | 57 |
| **16,000** | 46 | 5/64 | 48 | 49 | 51 | 56 |
| 18,000 | 45 | 46 | 47 | 48 | 50 | 55 |
| **20,000** | 44 | 44 | 45 | 46 | 49 | 54 |
| 25,000 | 3/32 | 42 | 43 | 44 | 46 | 53 |
| **30,000** | 38 | 40 | 41 | 42 | 44 | 52 |
| 35,000 | 35 | 36 | 38 | 39 | 42 | 50 |
| **40,000** | 31 | 33 | 35 | 36 | 41 | 48 |
| 45,000 | 30 | 1/8 | 32 | 33 | 38 | 47 |
| **50,000** | 29 | 30 | 1/8 | 31 | 36 | 46 |
| 55,000 | 28 | 29 | 30 | 30 | 34 | 44 |
| **60,000** | 26 | 28 | 29 | 30 | 31 | 44 |
| 65,000 | 24 | 26 | 28 | 29 | 1/8 | 43 |
| **70,000** | 22 | 24 | 26 | 28 | 30 | 42 |
| 75,000 | 20 | 5/32 | 24 | 26 | 30 | 3/32 |
| **80,000** | 18 | 20 | 22 | 24 | 29 | 40 |

| BTU INPUT | DRILL SIZES NATURAL GAS 3" W.C. | 3.5" W.C. | 4" W.C. | 4.5" W.C. | L.P. GAS 7" W.C. | 11" W.C. |
|---|---|---|---|---|---|---|
| 85,000 | 17 | 19 | 20 | 5/32 | 28 | 39 |
| **90,000** | 15 | 17 | 19 | 20 | 27 | 38 |
| 95,000 | 13 | 16 | 11/64 | 19 | 25 | 36 |
| **100,000** | 11 | 14 | 16 | 18 | 24 | 7/64 |
| 105,000 | 9 | 3/16 | 15 | 16 | 5/32 | 34 |
| **110,000** | 7 | 10 | 13 | 15 | 21 | 33 |
| 115,000 | 6 | 9 | 11 | 14 | 19 | 32 |
| **120,000** | 4 | 7 | 9 | 3/16 | 18 | 31 |
| 125,000 | 3 | 5 | 8 | 10 | 11/64 | 1/8 |
| **130,000** | 7/32 | 4 | 13/64 | 9 | 16 | 1/8 |
| 140,000 | #1 | 7/32 | 3 | 6 | 14 | 30 |
| **150,000** | 15/64 | #1 | 7/32 | 3 | 3/16 | 29 |
| 175,000 | 1/4 | C | 15/64 | #1 | 6 | 27 |
| **200,000** | H | F | 1/4 | C | 7/32 | 23 |
| 225,000 | L | J | 17/64 | F | A | 19 |
| **250,000** | N | L | K | I | C | 17 |
| 275,000 | O | N | M | 9/32 | F | 14 |
| **300,000** | 21/64 | O | N | 19/64 | H | 10 |

| | |
|---|---|
| K Factor .82 | Calculation based on natural-1050<br>BTU gas–0.65 spec. Gr./LP-2500 BTU gas–1.55 spec. Gr.<br>Approximate sizes based on average data for all orifices types |

## OHMS LAW EQUATION WHEEL




This "wheel" shows the equation for calculating any one of the basic factors of electricity – Watts (W), Amperes (I), Volts (E) or Ohms (R) – when any two of these factors are known. The elements to be calculated are shown on the rim of the wheel. Each quadrant shows three equations for solving the unknown. Select the equation appropriate for the known values.

**Example:** A 2400 Watt heater is connected to a 240 Volt circuit. How many Amps does it draw?

**Solution:** Since we are finding amps, the formula will be found in the I (Amperes) section of the wheel.

$\frac{W}{E}$ = I or 2400W ÷ 240V = 10 Amps

**What is the Resistance?**

$\frac{E^2}{W}$ = R or 240V x 240V ÷ 2400W = 24 Ohms

**CONVERSION TABLE FOR WATTS – AMPERES – VOLTS**

| WATTS | VOLTAGE (C – Single Phase) 120 | 208 | 240 | 277 |
|---|---|---|---|---|
| | AMPERES | | | |
| 500 | 4.2 | 2.4 | 2.1 | 1.8 |
| 1000 | 8.3 | 4.8 | 4.2 | 3.6 |
| 1500 | 12.5 | 7.2 | 6.3 | 5.4 |
| 2000 | 16.7 | 9.6 | 8.3 | 7.2 |
| 2500 | 20.9 | 12.0 | 10.4 | 9.0 |
| 3000 | 25.0 | 14.4 | 12.5 | 10.8 |
| 3500 | 29.2 | 16.8 | 14.6 | 12.6 |