

## FORMULAS

**Electrical cost** = HP x .746 x hours x Kw cost / motor efficiency

Example: 50 hp air compressor that runs 8 hours a day 5 days a week for a year with a \$.06 Kw electric rate and a 90% efficient electric motor.  $50 \text{ hp} \times .746 \times 2080 \text{ hours} \times \$.06 / .90 = \$5,172.27$  per year.

**Compressor RPM** = motor pulley diameter x motor rpm / compressor pulley diameter.

**Gallons** = cubic feet / .134

**Cubic Feet** = gallons x .134

**Pump up time (minutes)** =

$V$  (tank size) x (final pressure – initial pressure)

$7.48 \times$  atmospheric pressure x pump delivery (cfm)

Example: 7.5 hp compressor rated at 24 cfm with an 80 gallon tank – unit starts at 100 psi and turns off at 150 psi.

$80 \text{ gallons} \times (150 \text{ psi} - 100 \text{ psi})$

$7.48 \times 14.7 \text{ psi} \times 24 \text{ cfm}$

$4,000 = 1.51 \text{ minutes}$

$2,638$

**Pressure drop and horsepower:** Every 1 psi of pressure drop equals 0.5% in horsepower

**Heat and horsepower :** Rejected heat from an air-cooled compressor is equal to total machine horsepower x 2,545 BTU per hour

Example: 50 hp compressor with 3 hp fan motor will produce...

$53 \text{ hp} \times 2,545 = 134,885 \text{ BTU per hour}$

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