Formulas

Imperial

$$kW = \frac{CFM \times (T°2 - T°1) \times 1.08}{3413}$$

kW : Power in kW
CFM : Air volume in cubic feet per minute
T°2 : Temperature of air leaving heater in °F
T°1 : Temperature of air entering heater in °F

Metric

$$P = \frac{Q \times (T°2 - T°1) \times 1,21}{3600}$$

P : Power in kW
Q : Air volume in m^3/hr
T°2 : Temperature of air leaving heater in °C
T°1 : Temperature of air entering heater in °C

KW per square foot

Imperial

$$kW / pi^2 = \frac{kW}{S}$$

kW : Power in kW
S : Surface area in square feet

Metric

$$kW / m^2 = \frac{P}{S}$$

P : Power in kW
S : Surface area in m^2

Duct area

Imperial

$$S = \frac{W \times H}{144}$$

S : Surface area in square feet
W : Duct width in inches
H : Duct Height in inches

Metric

$$S = W \times H$$

S : Surface area in m^2
W :Duct width in meter
H : Duct height in meter

Electric power

Single phase

$$P = V \times I \quad \text{ou} \quad P = \frac{V^2}{R}$$

3 phase

$$P = V \times I \times 1.732 \qquad P = \frac{V^2}{R} \times 1.732$$

P : Power in Watts
V : Voltage in Volts
R : Resistance in Ω (Ohm)
I : Current in Amps

Line current

Single phase

$$I = \frac{P}{V}$$

3 phase

$$I = \frac{P}{V \times 1.732}$$

Conversions

∞F to ∞C

$$∞C = \frac{(∞F - 32)}{1.8}$$

∞C to ∞F

$$∞F = (1.8 \times ∞C) + 32$$

BTU to kW

1 kW = 3413 BTU/hre

kW to BTU

1 BTU/hre = 0.29307×10^{-3} kW

mm to inches

1 in = 25.4 mm

Inches to mm

1 mm = 0.03937 in

CFM to FPM

$$1 \text{ FPM} = \frac{1 \text{ CFM}}{S}$$

S : Surface area in square feet

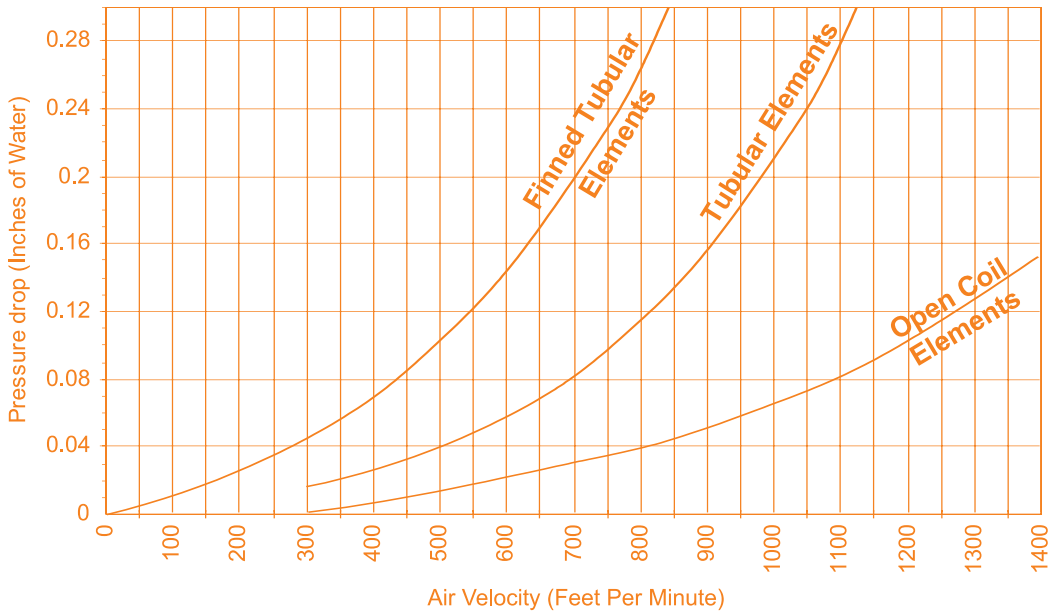
FPM to CFM

1 CFM = 1 FPM x S

Selection Guide

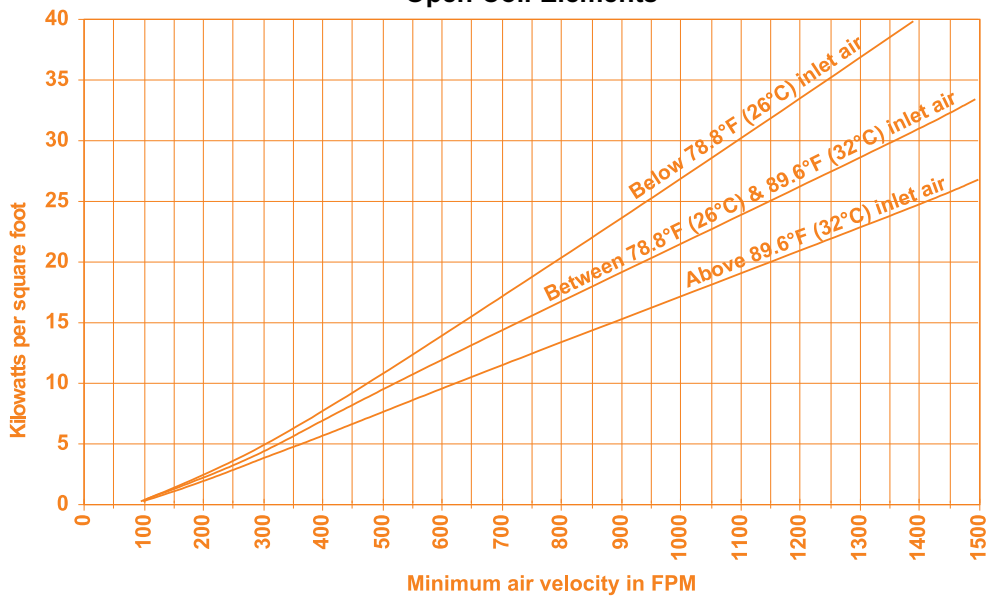
Element Types	Advantages	Disadvantages
Open Coil	- Excellent heat dissipation - Minimal pressure drop - Fast response time - More kilowatts per sq.ft. - Quick delivery	- Elements in direct contact with air - Cannot be installed in humid environments - Cannot be installed in dusty environments
Standard Tubular	- Less sensitive to humidity and dust - Suited for demanding environments - Excellent mechanical resistance - Heating element not in direct contact with air	- Increase in pressure drop - Slower response time - Less heat dissipation - Less kilowatt per sq.ft. - Longer delivery
Finned Tubular	- Good heat dissipation - Less sensitive to humidity and dust - Suited for demanding environments - Excellent mechanical resistance - Heating element not in direct contact with air	- Increase in pressure drop - Slower response time - Less kilowatt per sq.ft. - Longer delivery

Static Pressure Loss



Minimum Air Velocity

Open Coil Elements



Tubular Elements