

RESISTANCE WIRE

Fundamental physical laws apply to design of electrical resistance heating elements used in either alternating (AC) or direct (DC) current. Current in amperes (I) is equal to voltage (E) divided by resistance in ohms (R). More simply stated:

$$I = \frac{E}{R}$$

Where I = amperes
E = volts
R = ohms

Similarly: $E = IR$ and $R = \frac{E}{I}$

The quantity of heat in a circuit expressed in watts (W) is equal to the voltage (E) multiplied by current in amperes (I).

More simply stated

$$W = EI$$

Where W = watts
E = volts
I = amperes

Substituting above equation $I = \frac{E}{R}$ into the last equation $W = EI$

$$W = E \left(\frac{E}{R} \right)$$
$$= \frac{E^2}{R}$$

R

$$E = E''$$

-

R Where W = watts

E = volts

I = amperes

W

Similarly: $W = I'' R$ or $R = -$

I''