HEATER WIRING CONFIGURATIONS

Symbols:

V —> Line Voltage

I —> Line Current

W —> Total Watts

R —> Total Resistance

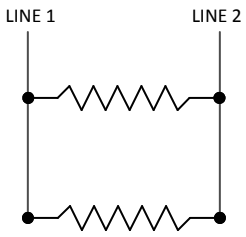
V_n —> Voltage across numbered resistive element

I_n —> Current through numbered resistive element

W_n —> Power in numbered resistive element

R_n —> Value of numbered resistive element

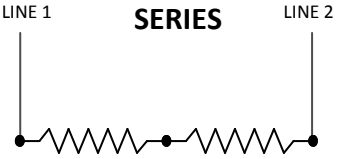
PARALLEL



$$V = V_n \qquad W = \sum W_n = \sum VI_n$$

$$I = \sum I_n = \sum \frac{V}{R_n} \qquad \frac{1}{R} = \sum \frac{1}{R_n}$$

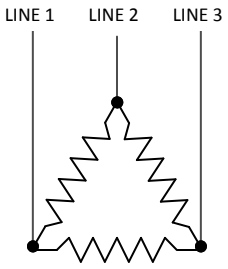
SERIES



$$V = \sum V_n \qquad W = \sum W_n = \sum VI_n$$

$$I = I_n \qquad R = \sum R_n$$

DELTA

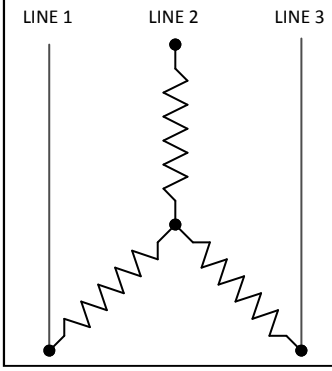


*** Assume Balanced Load (all resistors are equal) ***

$$V_n = V \qquad W = 1.73VI = \frac{3V^2}{R_n} = 3VI_n$$

$$I_n = \frac{I}{1.73} \qquad R_n = \frac{1.73V}{I} = \frac{3V^2}{W} = \frac{V}{I_n}$$

WYE / STAR



*** Assume Balanced Load (all resistors are equal) ***

$$V_n = \frac{V}{1.73} \qquad W = 1.73VI = \frac{V^2}{R_n} = \frac{3V_n^2}{R_n}$$

$$I_n = I \qquad R_n = \frac{V^2}{W} = \frac{3V_n^2}{W}$$