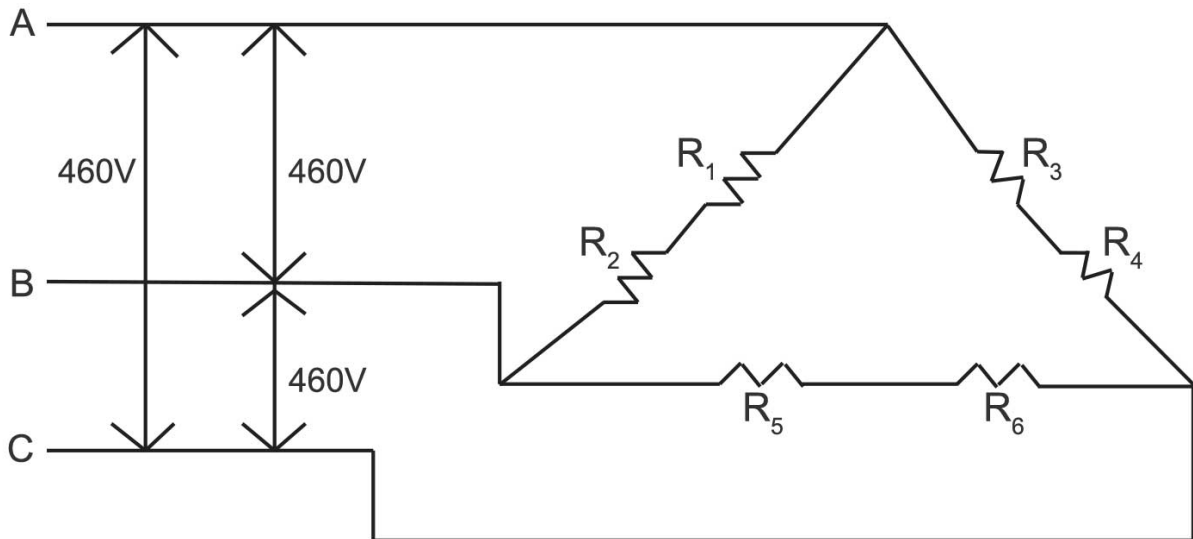


Case Study #204: How To Determine Amperage for Heaters

A customer called in and wanted to know what amperage he would be using on a machine with six heaters. The power supply was 460V, 3 phase power, and the heaters were wired in a delta configuration with 2 heaters on each branch. (See image below)



To Determine the Amperage:

6 heaters (R₁ - R₆) each at 230V, 1,000W

The resistance of each heater is calculated using the following formula:

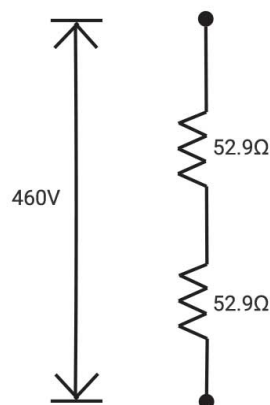
$$R = V^2 / P$$

So, the resistance of each heater equals $230^2 / 1,000 = 52.9\Omega$

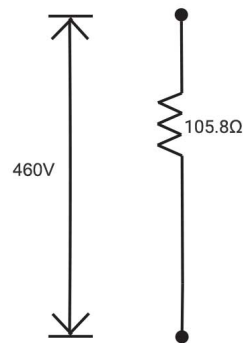
$$R_1 = R_2 = R_3 = R_4 = R_5 = R_6 = 52.9\Omega$$

Now, we wire two of these heaters in series between two legs of 460V, 3 phase power.

Each leg looks like:



In series, we can add resistances and simplify the circuit to look like this:



Now, finding the current is easy.

$$I = V / R$$
$$I = 460V / 105.8\Omega$$
$$I = 4.35A$$

So, the amperage is 4.35A for each leg.

Have a technical question about a heating application? Shoot our engineers an email today at engineering@thermalcorp.com

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