Should your heaters be wired in parallel or in series? 7/20/14

This question comes up when there is more than one heater to be connected to power. Basically any number of heaters can be connected in parallel, but usually only two heaters are connected in series. Connecting more than two heaters in series becomes much more complicated. With heaters connected in series, if a heater fails it can affect the other heaters. With heaters connected in parallel, the failure of one heater usually does not affect the other heaters.

The most common pairing is usually a two piece heater. In this case, if the heaters are connected in series, the voltage of each heater must be equal to half the total voltage available. For example, two 240 volt heaters connected in series across a 480 volt supply. Also the wattage of each heater must be equal. (If the wattage and voltage of each heater is not equal, the heaters will not split the total voltage equally.) If the two heaters are connected is parallel, the voltage of each heater must be the same as the supply voltage.

So why would you pick one way over the other? One reason is that some heaters may not be able to be built as reliably at one voltage. This has to do with the physical dimensions of the heater, and the watts and volts. Basically you want an optimum element wire (the wire that gets red hot) size in the heater. In some heaters, because of close spacing, the heater may not be able to be built at 480 volts. Also, if you wire in series, the failure of one heater most likely affects the other heater.

Remember, in parallel, each heater has the same voltage, but in series, each heater has the same current.

Basically, you only wire in series when you have two heaters of equal wattage and voltage. In most other cases, you wire in parallel.