

Two baseboard heaters connected to one thermostat.

Last Updated: Monday, January 15th, 2001, Created: Monday, January 15th, 2001

Frank is confused about series and parallel wiring. He wants to connect a small and a large baseboard heater to one thermostat and isn't sure how to go about it.

Although physically the wires will run from the thermostat to one of the baseboards and then on to the other baseboard, the way they are connected could be either series or parallel. But series and parallel will not give the same results.

Connecting the heaters in series means that one of the wires from the power source (the thermostat) goes on one end of the first heater, the other end of that first heater is connected to one end of the second heater, and the last end is connected back to the power source. The whole thing forms a loop. In this arrangement the 220 volts is across the combination of the two heaters and each heater will see only a portion of the 220 volts. The lower voltage across the two ends of a given heater means that the maximum temperature is lower than normal. In a series arrangement, neither heater will work to its full potential.

Connecting the heaters in parallel means that essentially the two wires coming from the power source (the thermostat) go to the two ends of the first heater, and the same two wires then continue on and are connected to the two ends of the second heater as well. This means that each heater will receive the full 220 volts, and each one will draw the amperage it was designed to in order to reach its maximum temperature. As long as the sum of the two amperages is less than the size of the circuit breaker (20 amps in the case of baseboard heaters), then they both get what they need. If you put too many in parallel on the same circuit, you simply blow the circuit breaker and nothing warms up.

$W=V \times A$ so maximum wattage is 220volts x 20amps = 4,400 watts on a single circuit.

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Keywords:

Electrical, Heating, Wire, Wiring