

HEAT

Checking Electric Strip Heat

Electric resistance “strip heat” is used as a primary or back-up heat source where gas is not available as a heat source. It is basically a coil of resistance wire that heats up when the proper voltage is applied to it. F.Y.I. did you know that if the resistance wire is glowing red you don’t have enough air flowing over the element? That’s right, it’s not supposed to glow. That’s why the equipment manufacturers go to so much trouble to make the approved match-up charts for heaters to air-handlers. More Kw’s doesn’t necessarily mean more comfort, it can mean more problems, more expense, more warranty claims.

The heater uses several components to control and protect the heating unit. It uses relays or sequencers to turn on the heat and snap-disc or one time thermal fuses to turn it off or lock it out in case of an over temperature situation.

Make sure before attempting to run the strip heat that the unit’s blower fan is on and running at the proper speed. The thermal fuse limits and the snap-disc limits need to be checked to make sure they are closed and able to conduct electricity. This is best done by removing wires from one side of the device then using your ohm meter to check continuity. If you find an open limit replace it only with equally rated parts. Don’t put yourself in jeopardy by replacing with a differently rated limit or jumping out a limit. They are there for safety reasons and if you choose to change it to something else you are responsible for the consequences. Some limits are “one time trip” only and cannot be reset, only replaced.

Single and “stack” sequencers are simply relays that are operated by an internal thermal heater that once 24 volts is applied slowly heats and “in sequence” closes the open relay contacts. To check these out simply put 24 volts on the proper terminals and use your volt ohm meter to see if the contacts close, in sequence if it’s a “stack”. If they don’t replace the sequencer.

Now the part that actually does the heating. It’s just a coil of resistance wire that looks like a coil spring stretched out some. Do a visual inspection of the heater coil and make sure that there are no breaks or shorts or sags in the coil. If there are sags in the coil then that is an indication that the heater has been operating at too high of a temperature and that needs to be checked out. Is that heater rated with that air handler? Is the fan operating properly? How about the filter and is there sufficient ductwork for the rated air flow?

For you nerds out there who want to know the formula for the proper element resistance, here we go; $RESISTANCE = \frac{Voltage \times Voltage}{WATTAGE}$. (R=VxV/W). So let’s do the math. The measured voltage is 220 volts and the heating element is a 5 Kw element. 220 times 220 = 48,400. Now divide that by 5000 and we get 9.68 ohms. You can directly measure the element and see how close we are. Anything off from that, you should remove the element and give it a good look.