



WARREN

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# Low Voltage Fire Starter

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In the early morning hours of an August day, a lady was awakened by her barking dog. She discovered her living room filled with smoke. In the hallway leading to her bedroom, she observed the air-conditioning thermostat on the wall burning. The plastic housing of the thermostat was burning and dripping onto the wooden floors. She quickly extinguished the fire with a towel and called the fire department.

The average residential air-conditioning and heating wall thermostat operates on 24 volts AC and therefore is not generally considered much of a fire hazard. A number of residential heating and air-conditioning systems use split units with generally an air-handling unit in the attic and a condenser unit in the yard. The low voltage thermostat wiring runs to both.

In this case, the low voltage thermostat wiring in the condenser unit was harnessed together with the high voltage (220 volts) wiring of the compressor. The wires were tie-strapped together to a copper refrigerant line. Vibration of the refrigerant line during operation of the unit chaffed the insulation off the low and high voltage wiring. As a result, the low voltage thermostat wiring was energized with high voltage, which damaged and overheated the circuits of the wall thermostat causing the fire.

The fire damage to this home was minor compared to the average fire scene and as a result, diagnosis of the failure was not difficult. If however, the fire had continued to burn resulting in significant damages, and we were absent a good witness, it would have been much more difficult. It is very important that even small fires that result in relatively minor damage be properly investigated and well documented. Such investigations will greatly aid in the investigation of larger fires that may involve similar equipment or similar failure modes.

The next time your fire investigator determines the origin area of a fire and that origin area contains a thermostat, don't be too quick to write it off because it is a low voltage device. In most cases, the outside condenser unit will survive the fire. It only takes a few minutes to check for shorts on the wires inside the condenser unit.