

## **DEMAND FACTOR FOR ELECTRIC FURNACE**

### **Question:**

Do the demand factors in Rule 62-116(2) & (3) apply to an installation of an electric furnace in a residential occupancy with individual zone control thermostats in each room or heated area?

### **Answer:**

The demand factors in 62-116(2) and (3) cannot be used with central electric furnaces and central electric boilers.

### **History:**

Substantial, historical, and current practice is that central electric furnaces are not generally controlled with individual, room thermostats.

Central electrical furnaces or boilers are either fully on or fully off, give or take a short time for the elements to cycle up or down. We understand by this to mean that "central furnace" implies a singular, central, thermostat.

Diversity, which underpins demand factors, does not apply to central furnaces. The history of the rule goes back to at least 1969, and to our knowledge has only been applied to baseboard systems. This is partial support for the continuation of this practice and for the proposition that present practice should not change until the rule changes. The rule would be much clearer if the text was amended to include a reference to a heater plus thermostat in each room or heated area.

There are control arrangements where a multi stage electric furnace [or boiler] is controlled by thermostatic control of a more elaborate nature. Room temp. sensors feedback to an intelligent or semi-intelligent central controller [e.g. DDC]. Dependant on the demand from the rooms served by the electric furnace or boiler the **staging** of the same is executed.

The individual thermostats in the boiler installation do not control electric heaters, they just open and close water valves. The heat inertia in the boiler system means that although individual thermostats temper the demand for heat, the electric heater draws all of its load at once and for an extended time until it heats up all the water.

We generally do not use the handbook to interpret and apply codes rules. But, the following quote seems very relevant to this topic: "The fact that all heaters may not be on at the same time allows the use of the demand factors shown"-- referring to 62-116.