

Multifamily Facility Management Services

SINGLE ZONE THERMOSTAT CONTROL

Description:

A single zone multifamily (or small commercial) hot water building is often difficult to control since individual tenants (or areas) do not have independent control of the heating that is delivered to their space. This is aggravated by the fact that different parts of such a building usually have slightly different heating requirements due to differences in internal and external heat gains (like lighting, cooking or solar radiation). The most common type of control for a single zone building is a thermostat. While this thermostat can play the most important role in determining whether the building is overheated, and whether operating costs are reasonable, it is often ignored.

There are three important things to consider when using a thermostat to control a single zone building: 1) finding the best location to use for the control point, 2) limiting accessibility to the thermostat to prevent tampering (ideally by using a remote sensing thermostat), and 3) using a thermostat capable of temperature setback.

Location is the first critical issue that needs to be determined for any thermostat in a single zone building. It is important to install the thermostat in a draft free location, ideally on an interior wall far from outside doors. The thermostat should also be situated away from cooling or heating sources, including lights. Also a location should be selected that is representative in terms of sensing average temperatures in the room or area that the thermostat is controlling. For example, in a multifamily building, the thermostat should be in an apartment not in a hallway or basement.

Another consideration is limiting accessibility to the thermostat to discourage tenant tampering. One solution might be to install a tamper-proof box over the thermostat. However, experience in a variety of buildings indicates that a better solution is to install a thermostat with remote sensing capability. This type of thermostat allows the control itself to be situated in the locked boiler room (or other suitable place), while one or more remote sensors are installed elsewhere in the building to act as control points. (Guidelines in the previous paragraph should be followed to find the best location for these remote sensors in a building.) Use of more than one remote sensor usually results in better control.

Several different companies make controls that are capable of remote sensing, but different companies have different control strategies if more than one remote sensor is used. In some

controls, the thermostat will operate on the average of all sensed temperatures; in others, the control uses the sensors as a “cold spot locator,” operating the heating equipment if any one of the remote sensors falls below the setpoint. The appropriate control strategy will differ for different buildings.

The third consideration for good control in a single-zone building is a thermostat with setback capability. Using a lower temperature on the thermostat (or setback) when tenants are asleep or the building is unoccupied is one of the best ways to save money during the heating season. The lower the temperature during setback in the winter, the more that can be saved. For example, in Minnesota a savings of about 1% can be realized for every degree the temperature is setback over every 8-hour period. Therefore, an 8-hour night setback of just 10°F during the heating season would save about 10%. Even if only a 3 to 5°F setback is possible in a building, it is still beneficial to setback the temperatures.

Thermostats that automatically setback system temperatures have been on the market for a long time and are very reliable and easy to install. Many different types of setback thermostats with a variety of features including remote sensing are available. Setback thermostats are also available with a variety of programs. A daily program may be adequate for a small commercial property which has the same schedule every day of the week, but a weekday/weekend program or complete 7-day program may be necessary for multifamily buildings. Because of the great variety of thermostat options, a certain amount of shopping around may be warranted. When comparing options, it is important to consider how easy the thermostat is to program and operate. In addition, the new thermostat should have some sort of back-up system (like batteries or an internal computerized chip memory), so that setpoints and times are retained in case of a power outage.

How to Implement:

Thermostats can be installed by a trained building maintenance person or a contractor can be hired to do the job. As part of the initial installation, the installer should check the calibration of the thermostat against a known reference and recalibrate it if necessary.

Since thermostat technology is always changing, it is useful to be alert to the availability of new products. Any good equipment supply house or contractor will be aware of new products as they become available. They also may be able to make recommendations regarding different features to consider for a particular application and to provide literature or samples so that different options can be compared more thoroughly.