Programmable Thermostat Savings

??? How much savings can I obtain from using a programmable thermostat?

It Depends On:

- ❖ The type of heating system you have whether it is fueled by gas, propane, or oil or is a heat pump
- ❖ Capacity of the system: is it right sized or over sized (over sizing is typical except for heat pumps)
- ❖ How efficient the house is: The best indicator is yearly fuel costs; homes with low bills will tolerate greater setback
- ❖ Whether you already manually adjust the thermostat
- ❖ On whether you can figure out how to program the new thermostat

General Discussion

Any disciplined regimen that sets back the thermostat when the house is not occupied or at night when occupants are asleep will save money. For those who are unlikely or unable to setback the thermostat, a programmable thermostat can help. It can also improve comfort over a manual setback regimen by returning the temperature to normal before you get up or come home from work. Every degree Fahrenheit the temperature is lowered in the heating season will save about 1% of heating costs.

If you already manually setback your thermostat, then you will not see much of a difference if you install an automatic setback thermostat. Maybe the most important feature to look for in a new thermostat is its user friendliness. The biggest reason people don't use their setback thermostats is they can't figure out how to program them. Look for models with easy to use controls and easy to see displays.

In the heating season, it is important to be aware of areas of the home where the temperature may drop low enough to cause pipes to freeze. If the heating system was properly sized or you have a heat pump, it might take too long to recover. Energy use might actually go up with a heat pump if the back-up electric furnace or strip heat comes on to recover the set temperature. A special setback thermostat can limit this problem by ramping up slowly to keep the back up heat off, but this will increase the time of recovery.

Setback thermostats provide the most savings in milder climates over colder climates. This means a bigger setback in early and late winter can produce bigger savings and is likely more tolerable when it isn't as cold outside.

What to do?

- ✓ Begin a series of tests to find the right setback temperature for your thermostat during the heating season. Don't wait until the coldest day of the year. Try this on a weekend so you are home to monitor the results. You can run the test during the day, but keep in mind solar gain may be providing heat to the home and temperatures will be lower in critical areas on the coldest nights. A combination of approaches may work based on

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outside conditions. Setback on the coldest nights, turning off the furnace on milder nights.

- Set the thermostat back 5 ^{o}F and time how long it takes to reach that temperature
- Go to places in the house that contain plumbing to make sure they are not going to freeze, abort if this may happen
- Return the thermostat to the desired temperature and time how long it takes to recover to the desired temperature. If you have a heat pump, monitor the thermostat to see if the back up heat comes on.
- If areas of the house with plumbing get too cold, the time of recovery is excessive, or the back up heat comes on, this method should not be used or reduce the setback.
- If areas of the house with plumbing remain warm, recovery time is acceptable, and the heat pump back up heat doesn't come on, then you may try a deeper setback.

✓ Now that you know the proper setback temperature and how long it will take your home to recover to comfortable temperature for winter, decide upon the schedule for each day of the week, and time of the day.

✓ Select an ENERGY STAR® programmable thermostat with at least two programs, four temperature settings each, a hold feature to allow temporary overrides, and the ability to maintain room temperature within 2^{o} F of the desired temperature.

Outcomes

❖ Houses that cool off quickly will have the greatest potential for savings from a setback. The heating system in the house has to run often to maintain temperature, so reducing the thermostat setting reduces its workload more. Houses that cool off slowly are more efficient and will have less potential for savings.

❖ The potential savings from an 8-hour, 10^{o} F setback will range from 5% to 15%. Shorter times or smaller setbacks will provider smaller savings. US DOE estimates that as much as 10% a year can be saved on heating and cooling bills by turning thermostats back 10% to 15% for 8 hours.