

## Programmable Thermostats

Programmable thermostats save energy by permitting occupants to set temperatures according to whether the house is occupied. These thermostats can automatically store and repeat settings daily with allowance for manual override. By eliminating manual setback, which is easy to forget, they allow the setting of more comfortable temperatures in the morning before occupants wake. Temperature setback can be adjusted for both heating and cooling seasons.

The average household spends more than \$2,200 a year on energy bills — nearly half of which goes to heating and cooling. Homeowners can save about \$180 a year by properly setting their programmable thermostats and maintaining those settings.

Programmable thermostats typically offer a number of programming options:

- Daily programming that allows one schedule to be used each day.
- Weekday/Weekend (5/2) programming that allows adjustment of timing for setbacks with different settings for weekdays and weekends, and with 5/1/1 programming that permits separate schedules for Saturday and Sunday.
- Full seven-day programming that permits a different setback schedule for each day of the week. Other special features depend on manufacturer and model and may include the following:
  - Vacation Override, which allows temporary override of the programmed settings.
  - Keyboard Lock, which prevents unauthorized changes to the preprogrammed settings.
  - Low Battery Indicator indicates whether the battery used to hold the programmed schedule is low.
  - An Energy Monitor that can keep track of how many hours the HVAC system has run for any selected time period.
  - An Auto Season Changeover that automatically provides heat or cooling at the onset of the heating and cooling season.
  - A Filter Change Indicator that goes on after a pre-set time period to remind when it is time to clean or replace the filter.

ENERGY STAR qualified programmable thermostats come with presettings as follows:

### Programmable Thermostat Setpoint Times & Temperatures

Setting	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Wake	6:00 a.m.	≤ 70° F	≥ 78° F
Day	8:00 a.m.	Setback at least 8° F	Setup at least 7° F
Evening	6:00 p.m.	≤ 70° F	≥ 78° F
Sleep	10:00 p.m.	Setback at least 8° F	Setup at least 4° F

### Installation

For starters, install your programmable thermostat unit on an interior wall, away from heating or cooling vents and other sources of heat or drafts (doorways, windows, skylights, direct sunlight or bright lamps). Remember: Read all instructions and proceed carefully! Programmable thermostats are a low voltage wiring installation and involve anywhere from 2–10 wires, depending on your type of heating and cooling system. However, you should shut down your electricity during any replacement. The previous attachment points will reconnect your new unit.

If the job requires more than just a replacement, call your certified HVAC professional to ensure proper installation, as well as operation of your heating and cooling system. It's a good idea to upgrade an old manual thermostat to a programmable unit if you're replacing a CAC or heating system given that programmable thermostats are far more accurate and will maximize the efficiency of your new system. Heat pumps may require a special unit to maximize energy savings year-round. Talk to your retailer or HVAC contractor before selecting the thermostat.

Also, if you're replacing a manual thermostat that has a mercury switch, be careful not to break the tube that holds this toxic substance. Contact your local recycling/hazardous materials center, or the manufacturer of your new thermostat, for advice on proper disposal.

Different types of heating/cooling systems may require different types of programmable thermostats. For example, heat pumps require programmable thermostats that minimize the use of less efficient auxiliary electric resistance heating. Only a few companies manufacture line-voltage setback thermostats that directly control 120 volt or 240 volt line-voltage circuits connected to electric baseboard electric heaters. When purchasing a programmable thermostat, it is necessary to insure the thermostat is compatible with the HVAC system.