



# HOME VENTILATING INSTITUTE

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## Ventilation Controls for Life-Styles

In recent years, as new homes have become more airtight, the awareness of the need for residential mechanical ventilation has been growing more than ever. Proper ventilation is essential to removing excessive moisture that promotes mold and mildew build-up and that can deteriorate the building's structure. Ventilation is also important to help reduce the build up of volatile organic compounds (VOC's) that affect indoor air quality (IAQ) and may cause health problems for occupants.

There are a number of factors to consider when designing a residential mechanical ventilating system.

These include:

- Type of ventilation: *Intermittent* (local or spot) ventilation vs. *Continuous* (general, central or whole-house) ventilation
- Air flow (cfm, or cubic feet per minute)
- Sound rating (sones)
- Duct material and type of installation
- Source of make up air
- **Controls**

This article will discuss residential control options to help the reader select a suitable device for the homeowner and/or occupant's life-style.

Different life-styles place different demands on the ventilating system. For example, a single adult, most likely, will require less ventilation than a family of five with pets. Also, an adult homeowner may be more likely to properly operate a manual ventilating control than a tenant or children that share a bathroom. Therefore, selecting a suitable control that runs ventilation at the proper time and for a desired duration will ensure that both the occupant's health and building structure are protected.

There are several types of *manual* and *automatic* controls available on the market that can be applied to ventilating systems. Some controls are more suitable for intermittent and some for continuous ventilation. Before deciding on a particular control, you need to determine what type of ventilation you require. For example, do you need intermittent ventilation for moisture and odor removal; or continuous ventilation for indoor air quality; or a double-duty fan and control to cover both intermittent and continuous modes.

### **Manual Controls:**

Manual controls require the occupant to activate the ventilating system. The advantage of a manual control is that the occupant can turn it on when needed. For people that are particularly sensitive to indoor air quality a manual control allows them to maintain their

comfort level. The disadvantage of manual controls is that some people may not sense the need for ventilation and as a result do not turn it on, even when it should be.

There are many types of manual controls. The most basic one is an on/off toggle switch. However, other controls have functions that make ventilating operation more suitable to the occupant's life-style.

**Delay off timer:** Shower the shower curtain, towels, walls and cabinets retain moisture long after the occupant has finished and left the bathroom. This moisture promotes the growth of mold and mildew. The advantage of a delay off- timer is that it continues to evacuate moisture and odor after the occupant has left.

**Manual timers:** There are two basic types of manual timers. The less expensive are spring-wound and known as a "countdown timers". These come in various intervals from 0 – 24 hours. 0-60 minutes is a range that is most suitable for intermittent bathroom ventilation. Electronic timers are more decorative and generally more expensive but allow the occupant to select time duration with a push of a button. Electronic timers do not produce the sometimes annoying ticking sound that countdown timers are known to make.

**Speed Controls:** Residential speed controls can be found at building supply stores, often stocked near ceiling mounted paddle fans. They allow the user to set desired speed of a ventilating device. The speed can be controlled either continuously or in steps. A speed control is used to vary airflow. One of the disadvantages of speed controls is that they can cause an undesirable fan motor humming noise.

### **Automatic Controls:**

Automatic controls are fully or semi automatic. With a fully automatic control, you set it and forget it. An example of this is a 24-hour duty cycle timer that is programmed to cycle on and off over a 24-hour period. A semi-automatic control is an automatic control that has an override switch. An example would be an occupancy sensor with a manual on/off override. An automatic control operates the fan on demand. Demand can be caused by occupancy, humidity, carbon dioxide, time or any other parameter.

**Occupancy (motion) sensors:** Occupancy sensors are very suitable for intermittent ventilation. Their advantage is that the ventilation system will operate without having to rely on the occupant's interaction. The ventilation system will remain on and continue working for a period after the occupant has left the room, much like a delay off timer.

**Humidity sensors (de-humidistat):** De-humidistats can be used to turn on/off a ventilating system when relative humidity reaches a certain level. These controls are most likely to be used in bathrooms to evacuate excessive moisture. De-humidistats have a few disadvantages. One disadvantage is that seasonal changes in outdoor relative humidity necessitate seasonal readjustments to function optimally. Another disadvantage of the de-humidistat compared to other controls is it requires rather complicated wiring and programming.

**Automatic timers:** Automatic timers turns fans on and off at programmed times throughout the day. Typically, a 24-hour programmable timer is used to run the fan in morning and evening hours when there is a high demand for ventilation. It can also be programmed to be off during hours the occupants are typically out of the house. For continuous ventilation, the control can be programmed to turn on and off throughout the day to help evacuate any build up of VOCs or other indoor air pollutants.

It is also important to know that switches can be used in combination with other type of controls to provide both intermittent and continuous ventilation. For example, a programmable timer may be used to cycle the fan “on and off” throughout the day to address over all indoor air quality and a relay to a on/off toggle switch can be on the same system so that the occupant manually overrides the timer and turns the fan on while using the bathroom. The key to selecting the right control or combination of controls us to first understand the occupant’s life-style and ventilating needs. Then select a control that provides proper ventilation with little or no involvement by the occupant. Contact HVI members for the specific controls preferred and recommended for their products.