

# Ventilation System Operating Instructions

## Whole House Ventilation Systems Integrated with a Forced Air Heating System<sup>1</sup>

Your new home has been constructed to use energy efficiently, while maintaining a healthy indoor environment with good supply of fresh air. To help you achieve these benefits, we recommend that you take a few minutes to read these instructions.

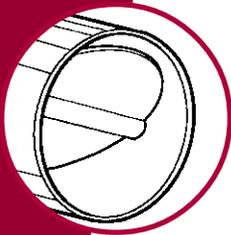
Your home has been constructed to the most current requirements of the Washington State Energy Code (2003 edition) and the Washington State Ventilation and Indoor Air Quality Code (2003 edition). This means your home and the ductwork of your heating system have been well sealed, which limits uncontrolled exchange of air between the indoors and outdoors. The amount of fresh air provided to your home is under your control. You can increase the ventilation rate of your home by opening windows, or by operating your mechanical ventilation systems. Your home has two types of mechanical ventilation: spot ventilation fans, and a whole house ventilation system integrated with your heating system.

### Spot Fans:

A spot fan has been installed in each bathroom, the utility room and the kitchen. If your home includes an indoor spa, or any other room that may need additional ventilation, a spot fan will be included there as well.

The purpose of spot ventilation is to control excess moisture, odors, or chemical byproducts at the source. It is far more effective to quickly eliminate moisture and pollutants when they are created than to allow them to dissipate slowly over time. Controlling moisture reduces the cause of many molds and protects the finishes of your home. Controlling odors and chemical byproducts reduces any health hazard that may be associated with them.

It is particularly important to operate your kitchen fan if you have a gas or propane range. As well as removing moisture and odors created by cooking, your kitchen exhaust fan removes the unhealthy byproducts of combustion, including carbon monoxide and nitrogen oxides.



### Recommended spot fan operation:

- Turn on the spot fan whenever moisture, odors, household chemicals, or combustion byproducts are present in the room, such as during showering, washing clothes, or cooking.
- Since moisture vapor, odors, and combustion byproducts tend to linger, run the spot fan for up to 60 minutes beyond the activity that produced them.

### Whole house ventilation integrated with the heating system.

The forced air heating system in this home is equipped with a ventilation system. This system includes a fresh air intake connected to the return air duct (return air is the air that flows into your heating system), a damper that controls the amount of air that enters the system, and a timer that controls when the system operates. To change the amount of ventilation in your home adjust the timer to increase or decrease the time the system operates. In some cases you may also want to adjust the damper.

Here's how the system works:

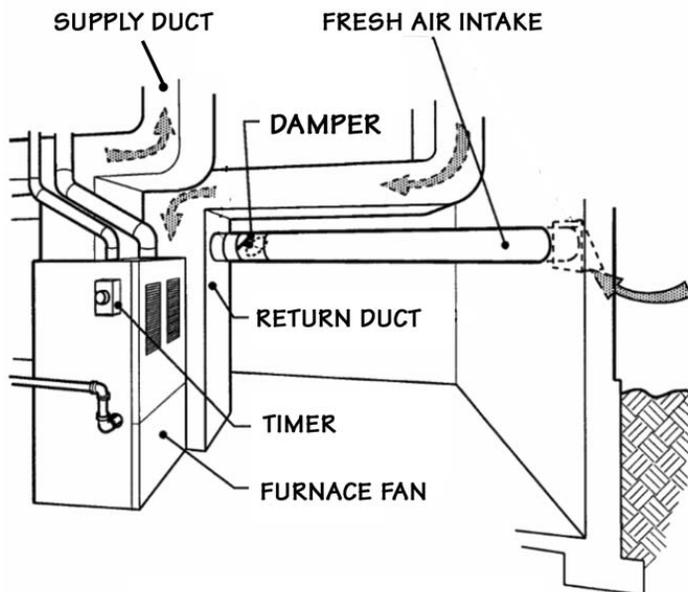


Figure 1. Whole house ventilation system integrated with a forced air heating system.

- When the ventilation timer calls for ventilation, the furnace fan motor turns on. If the ventilation system is equipped with a mechanical damper, it also opens.
- The furnace fan pulls fresh air through the fresh air intake into the return air duct.
- Fresh air is then distributed to the home through the supply air ducts of the heating system.
- When the ventilation timer shuts off, the furnace fan motor turns off. If the system has a mechanical damper, the damper also closes.

Note: If your system is *not* equipped with a mechanical damper, your home will also receive ventilation whenever the system fan operates, including when it's on to provide heating or cooling.

### Selecting a Whole House Ventilation Schedule:

Your contractor has set the timer on your ventilation system to provide a minimum of eight hours of ventilation per day. To get the maximum benefits of the system, you'll want to adjust the timer to suit your own schedule.

- Run the system more when you expect to be home, or when more people are expected to be in the home.
- Set the timer to cycle the system on and off for short periods. For example, 10 minutes on, 20 minutes off.
- Use the manual control to turn the system on when large groups gather in your home.

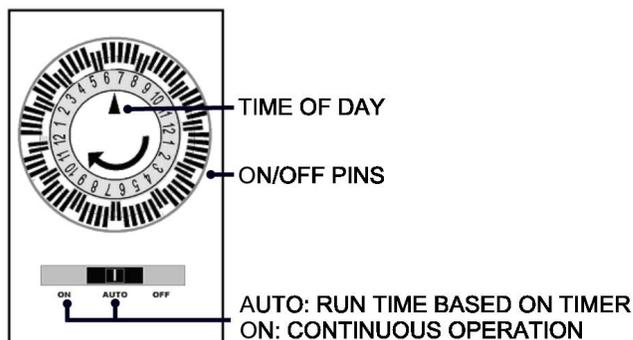


Figure 2. Typical whole house ventilation timer.

Note: The spot and whole house ventilation systems included in your home are only intended to provide ventilation for common household activities. They do not provide enough ventilation to overcome the chemical hazards associated with painting, shop activities or the byproducts of un-vented combustion heaters.

- Before you change the damper setting, make note of the position of the damper adjustment. You will need to return the damper to this setting when the extreme weather passes.
- Only reduce the ventilation rate when absolutely necessary.
- Be aware for signs of under-ventilation, including smells and high humidity.

## Dampers:

There are three types of dampers allowed by the ventilation code. Figure 3 identifies these dampers and describes how they work. This system uses the damper checked below.

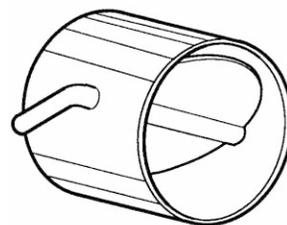
- Manual Damper
- Constant Air Flow Regulator
- Motorized Damper

As required by code<sup>2</sup>, your heating contractor has tested the flow rate of fresh air brought into your home and set the damper accordingly.

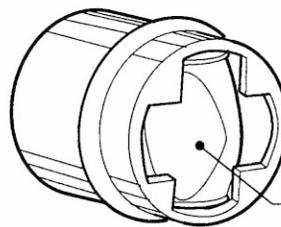
### Manual Damper Operation:

In normal operating conditions, the damper is always open, regardless of the settings on the ventilation timer. The home receives ventilation whenever air handler fan turns on, or when the thermostat calls for heating or cooling.

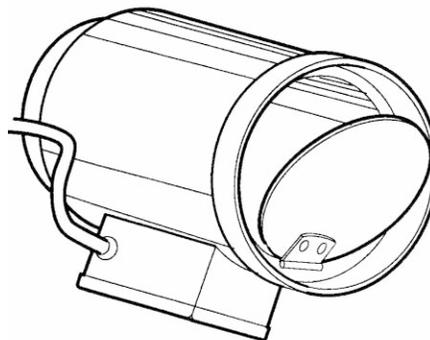
Using the timer to regulate the ventilation rate is always the best choice. But because this system provides ventilation to the home whenever the air handler fan operates, ventilation rates may be excessive during very cold or very hot weather. This can mean wasted energy and an uncomfortable home. In this case, you may wish to adjust the manual damper. Before doing so, keep a few things in mind:



MANUAL DAMPER  
AIR VOLUME  
ADJUSTMENT FIXED:  
ALWAYS OPEN.



CONSTANT AIRFLOW  
REGULATOR  
INTERNAL BLADDER  
REGULATES AIR VOLUME  
BASED ON RETURN DUCT  
AIR PRESSURE ALWAYS OPEN.



MOTORIZED  
DAMPER  
A MOTOR OPENS THE  
DAMPER ONLY WHEN  
VENTILATION IS CALLED  
FOR BY THE TIMER.  
VOLUME IS REGULATED  
BY OPEN DAMPER  
POSITION ADJUSTMENT.

Figure 3. Selection of dampers used to meet the VIAQ code.

---

## Constant Air Flow Regulator: (CAR)

In normal operating conditions, the damper is always open, regardless of the settings on the ventilation timer. The home receives ventilation whenever the timer turns on the air handler fan, or when the thermostat calls for heating or cooling.

This type of damper is always open. No manual or automatic adjustments are available with this system.

## Motorized Damper Operation:

This system is controlled by the whole house ventilation schedule you have programmed on your timer. This system only provides ventilation when the timer calls for ventilation. No other user adjustments are needed.

## Combinations of Dampers:

While the code requires only one of the dampers noted here, a manual damper or CAR may be used in conjunction with a motorized damper. The motorized damper controls On/Off functions, while the manual damper or CAR regulates the airflow rate.

## Additional Information:

For more information on the Washington State Energy Code, or the Washington State Ventilation and Indoor Air Quality Code, visit:  
<http://www.energy.wsu.edu/code>



## References

- <sup>1</sup> "Prescriptive Requirements for Intermittent Whole House Ventilation Integrated With a Forced-Air System," Chapter 3, Section 303.4.2, *Washington State Ventilation and Indoor Air Quality Code (2000 edition)* [effective July 1, 2001], Washington State Building Code Council.
- <sup>2</sup> "Ventilation Rates for All Group R Occupancies Four Stories and Less," Chapter 3, Table 3-2, *Washington State Ventilation and Indoor Air Quality Code (2000 edition)* [effective July 1, 2001], Washington State Building Code Council.

## Funded by:



United States  
Department of Energy



NORTHWEST  
ENERGY  
EFFICIENCY  
ALLIANCE  
[www.nwalliance.org](http://www.nwalliance.org)

© 2002 Washington State University Extension Energy Program.  
This instruction sheet contains material written and produced for public distribution. You may reprint this written material, provided you do not use it to endorse a commercial product. Please reference by title and credit Washington State University Extension Energy Program.  
Published September 2002. WSUEEP2002-023