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HRAI is pleased to provide the support for the timely and ongoing information in this column for OBOA members.

Residential Ventilation Issues

by Dara Bowser & Bob Allison

What Switches Go Where for Ventilation Systems

The Ontario Building Code Section 9.32 has several inter-related requirements for controls. These may be summarized as follows:

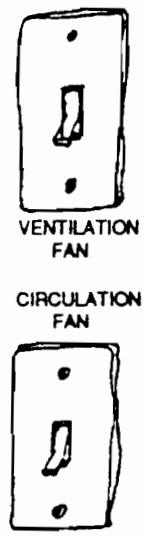
a) The *Principal Ventilation Fan* is required to be controlled by a centrally located on-off switch which is marked **"Ventilation Fan".** A de-humidistat or other automatic control may be used, but it must be in addition to the manual switch. [9.32.3.4.(2), (3),(4)] Because the *Principal Ventilation Fan* is interpreted to include the exhaust fan of an HRV, these control requirements also apply to HRV's unless the entire system is designed according to Part 6.

A simple dehumidistat is not acceptable, and must be accompanied by a manual control, or incorporate an "on-off" switch. Some HRVs incorporate a "ventilate" and "re-circulate" position switch which can be taken to meet the requirement because effectively the ventilation system is "off" when the switch is in the "re-circulation" position.

b) When the *Principal Exhaust Fan* is more than 50% larger than the required capacity, then it must be able to be speed controlled to within 10% of the required capacity, and the speed control must be in the same location as the **"Ventilation Fan"** switch. [9.32.3.4.(6)] This requirement is designed to prevent the use of systems which would over-ventilate the home if they were left on continuously at their lowest speed. To meet this requirement, the centrally located control must be equipped with an on-off function as well as the speed control. In a simple form, this could be provided by a rotary-type variable speed control with an "off" position. For an HRV, this could be provided by a manual on-off switch and a high-speed override. The high-speed override could be provided by a dehumidstat.

c) *Supplemental exhaust fans* are required to be controlled in the same room as the exhaust air inlet. [9.32.3.5.(5)] This requirement is simply met when the Supplemental Exhaust fans are individual exhaust fans. For over-head fans an on/off wall switch (separate from the light switch) is used, and for a rangehood, the switch is usually located on the hood itself.

In the case where a *Principal Exhaust Fan* also provides the required exhaust from a kitchen, a water-closet or bathroom, the fan would be required to be controlled by a switch in the room(s) which it serves in addition to the centrally located **"Ventilation Fan"** switch. The OBC is not clear as to how the two switches are to work together, but the best arrangement is a parallel set-up where any switch may turn the fan on, and all switches are required to be off for the fan to be off.



In the case of a two-speed exhaust fan or HRV, it would be appropriate to locate high-speed override switches (rather than on-off switches) in the rooms that the fan or HRV serves. Some HRV systems use one-shot internal timers that operate the system on high speed for a fixed period of time (15 to 30 minutes) after which the system returns to low speed or off, depending on the setting of the centrally located switch. A dehumidistat is not an appropriate control for use in these locations and sentence 9.32.3.5(6) asks for a manual control in addition to the dehumidistat.

d) In the case of any system which depends on a forced-warm air system to distribute ventilation air, a **"Circulation Fan"** switch is required to be located beside the **"Ventilation Fan"** switch. The **"Circulation Fan"** switch is required to control the furnace blower so that it will operate to circulate air around the house without operating the heating or cooling functions of the furnace. The location of these two switches beside each other is all that is required to satisfy the "Coupling" requirements of Sub-section 9.32.3.6.

Although the OBC does not require it, a furnace with a two-speed blower will give much better results than a system with a single speed blower. In some situations, the **"Circulation Fan"** switch can be incorporated into the base of the thermostat as the "Fan" switch. In this situation however, the markings on the thermostat do not correspond strictly with the requirements of sentence 9.32.3.6.(5).

Some HRVs are able to be equipped with circuits which interlock them to the furnace so that when the **"Ventilation Fan"** switch is operated, the furnace blower will automatically be turned on. If this control arrangement is installed, then there is no need for the **"Circulation Fan"** switch. It should be noted that anyone connecting controls to a furnace requires the appropriate knowledge and qualifications.

This and other topics are covered in detail in the 2-day OBOA workshop: **"Residential Ventilation Systems for Building Officials".**

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