

# Building Control Systems



## Use of Demand Control Ventilation in Your HVAC System

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There is a lot of talk in the HVAC industry about use of Demand Control Ventilation (DCV) and how important it has become in saving energy in buildings. With the recent legislation in the U.S. Congress and the state of California, many more people are becoming aware of the energy crisis.

What is DCV? DCV is a method of controlling the ventilation in a space based on the actual occupancy using CO<sub>2</sub> sensors. Building HVAC ventilation systems are designed to provide fresh air to the maximum design occupancy of the space. But not all spaces are at the maximum occupancy all of the time. DCV control allows the building owner/occupants to save energy by lowering the ventilation rate to the actual occupancy of the space.

When you lower the ventilation rate to allow for the exhaust of the building effluents, you need a reliable method of determining when to provide additional fresh air. But you don't want to over-ventilate and waste energy.

Some people in the industry use a CO<sub>2</sub> sensor with a 0-10Vdc output to a damper actuator to achieve DCV. In a system using a CO<sub>2</sub> sensor for DCV, the outside damper modulates open based on the call for ventilation from the CO<sub>2</sub> sensor. The damper is allowed to drive full open.

What if it is -30° F outside or 99°F plus 90% RH? Do you want the damper wide open? The obvious answer is no. You want a control that will allow the installer to set the minimum position to the level of ventilation required for building effluents and a small number of people.

When the occupant level increases and the CO<sub>2</sub> level goes up, you need to open the outdoor dampers above the minimum building effluent level for the increased number of occupants. But you do not want to open the outdoor dampers to let in air that needs to be conditioned. To solve this issue, you need a DCV maximum control on the damper that allows only the amount of air required by the building code or design code for the building. Then when the CO<sub>2</sub> sensor opens the outdoor damper to allow fresh air into the building, you are meeting the ventilation code for the number of occupants (based on CO<sub>2</sub>) but aren't exceeding the ventilation required by code.

### W7212 Economizer Logics With DCV

Honeywell has a solution: the W7212 economizer logics with DCV. The operator sets the minimum position



W7212/W7213/W7214  
Logic Module



C7232A Sensor



Black Motor



C7046

potentiometer to ventilate for the building effluents and low occupancy. A DVC setpoint on the logic module allows the operator to determine the CO<sub>2</sub> ppm threshold (e.g., 800 ppm) where additional ventilation is required for the number of people in the space. When the CO<sub>2</sub> level in the space reaches the threshold, the outdoor dampers will modulate open to ventilate for the higher occupancy. But not too much ventilation. There is a DCV maximum potentiometer setting that the operator sets to the design ventilation rate, the ventilation rate for the maximum occupancy. The space will not be over-ventilated, and the building code will be met. And, most importantly, the building owner will be saving energy—not over-ventilating with cold air or hot and humid air that would need to be conditioned.

Combining the DCV with the economizer function of using fresh air to cool your building improves your energy usage and insures the right amount of ventilation for good indoor air quality. No more closed dampers to prevent higher energy bills—no complaints from occupants from lack of fresh air.

### Saves Money, and Easy to Use

Honeywell provides a product simulator for your PC that is simple to set up and use. The tool allows you to make changes on the economizer logic and observe the operation of the damper's LEDs, etc. You can see when the outdoor air is bad for economizing and what happens if you have an input from the DCV CO<sub>2</sub> sensor.

Show your customer how he can save energy in his area with the Honeywell savings estimator. Not every area needs to use enthalpy for control. You may only need temperature input in your area. The savings estimator is a quick and simple tool to determine the right control for a specific area.

Take advantage of those energy rebates. Be prepared when tax time comes around. Save energy today.