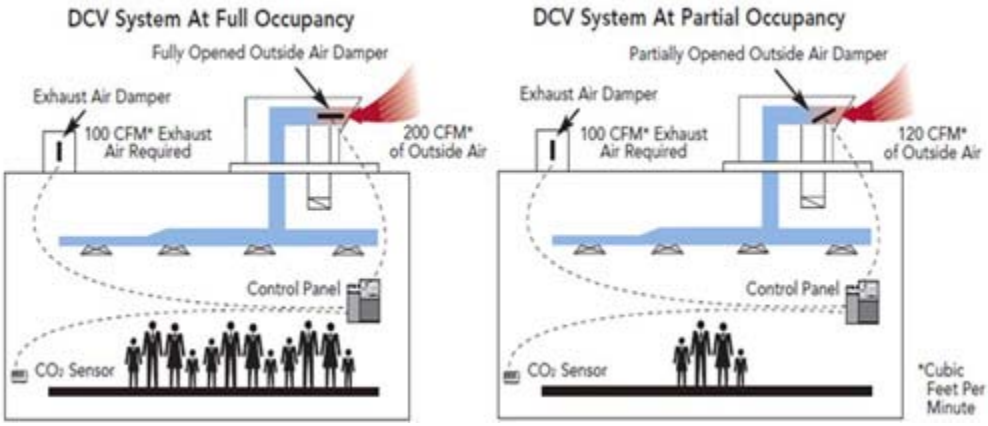
Demand Control Ventilation

What is Demand Control Ventilation?

Demand Control Ventilation is recognized as a method of ensuring a building is ventilated, cost effectively, while maximizing indoor air quality. Generally, sensors are used to continuously measure and monitor ambient conditions in the conditioned space and provide real time feed back to the space controls which adjust dampers and in many cases, the fan speed by modulating the ventilation rate to match the specific use and occupancy of the building.

Building ventilation systems often operate at constant or pre-determined ventilation rates regardless of the occupancy level of the building. Ventilation rates are normally based on maximum occupancy levels resulting in consequent energy wastage. The energy wastage is not only due to the fan operation, but also includes the energy used to condition the air, whether in heating or cooling mode. Significant energy savings are made by effective DCV which ensures that the ventilation rate continuously matches the current occupancy rate and varying ambient conditions



Jump-start Your Energy Savings

Meet fresh air requirements in your building with a demand control ventilation system. You can reduce energy costs by a minimum of 10% and as much as 40% a year by adjusting the building's ventilation based upon actual occupancy. The air-conditioning system will operate more efficiently, which can also lower maintenance costs and may extend the life of your system. Rebates are available for installing the technology with Demand Control Ventilation systems.

Sources: Honeywell, Yorkland, Flordia Light and Power

What are the benefits of DCV?

- Energy Savings of 10% to 40%
- Better air quality and more comfortable spaces
- Increased employee health and customer satisfaction
- Reduced operating costs
- Installation savings with Utility rebates
- Lowered monthly Utility bills
- Greater energy efficiency
- Less impact on the environment

Technology

Technology exists which can be used in a number of common applications to reduce outside air flow, at low occupancy, and modulate incoming outside air flow based on real-time sensor readings.

Technology Used by Application

Packaged rooftop units

Economizers in packaged rooftops have been used for years to provide “free cooling” when outside air conditions permit. Outside air is used to cool the building before mechanical stages of cooling are energized.
These economizers are easily upgraded by adding a Carbon Dioxide (Co2)sensor to further increase the savings, by adjusting the incoming air to match the number of people in the space. Why bring in more air into the space than is required? This excess air then needs to be further cooled or heated - representing energy waste.

Economizers with Co2 sensors are a great first step towards savings when the space has slow occupancy, during normal business hours.

Further savings can be realized by adding a Occupancy sensor to the space controller (typically a programmable thermostat). During NO OCCUPANCY, the occupancy sensor will inform the thermostat and the economizer which in-turn adjust the temperature and incoming air to further increase the savings.

ECONOMIZER+OCCUPANCY SENSOR+SMART THERMOSTAT = MAXIMUM SAVINGS

Sources: Honeywell, Yorkland, Flordia Light and Power

Make Up Air Systems

Make Up Air (MUA) systems are “air handlers” which provide fresh air into buildings to “make up” air that is being exhausted. For example in High-Rise residential applications, MUA units provide air that is being exhausted by kitchen and bathroom exhaust.
The MUA is generally designed to provide incoming air at 100% regardless if the building is fully occupied or not.
Energy Savings can be achieved by installing a Variable Frequency Drive (VFD) on the supply fan. The VFD will modulate the fan based on occupancy or most commonly- by time clock. During obvious occupied periods, the VFD with set the fan speed at 90% speed (nearly 100 air flow). During low occupancy (say mid morning , afternoon, or 2 AM) in an apartment building, the fan speed is set 60% air flow. Again, the principle is to minimize the amount of excess air that is brought in that will then need to be conditioned.

Industrial Applications

In industrial applications, the control technology used is more complex, but the principle is the same. Incoming air is matched to the air that is being exhausted. Control technology used is a combination of VFDs, C02 Sensors, and exhaust fan status monitoring.

Who should install this technology?

Facilities with operating hours where occupancy varies and is unpredictable
Buildings that seldom reach maximum occupancy
Facilities that may qualify include:

- Retail Stores
- Commercial Buildings
- Supermarkets
- High Rise Residential
- Theaters
- Lecture halls and other performance spaces
- Places of worship
- Schools
- Hospitals
- Restaurants