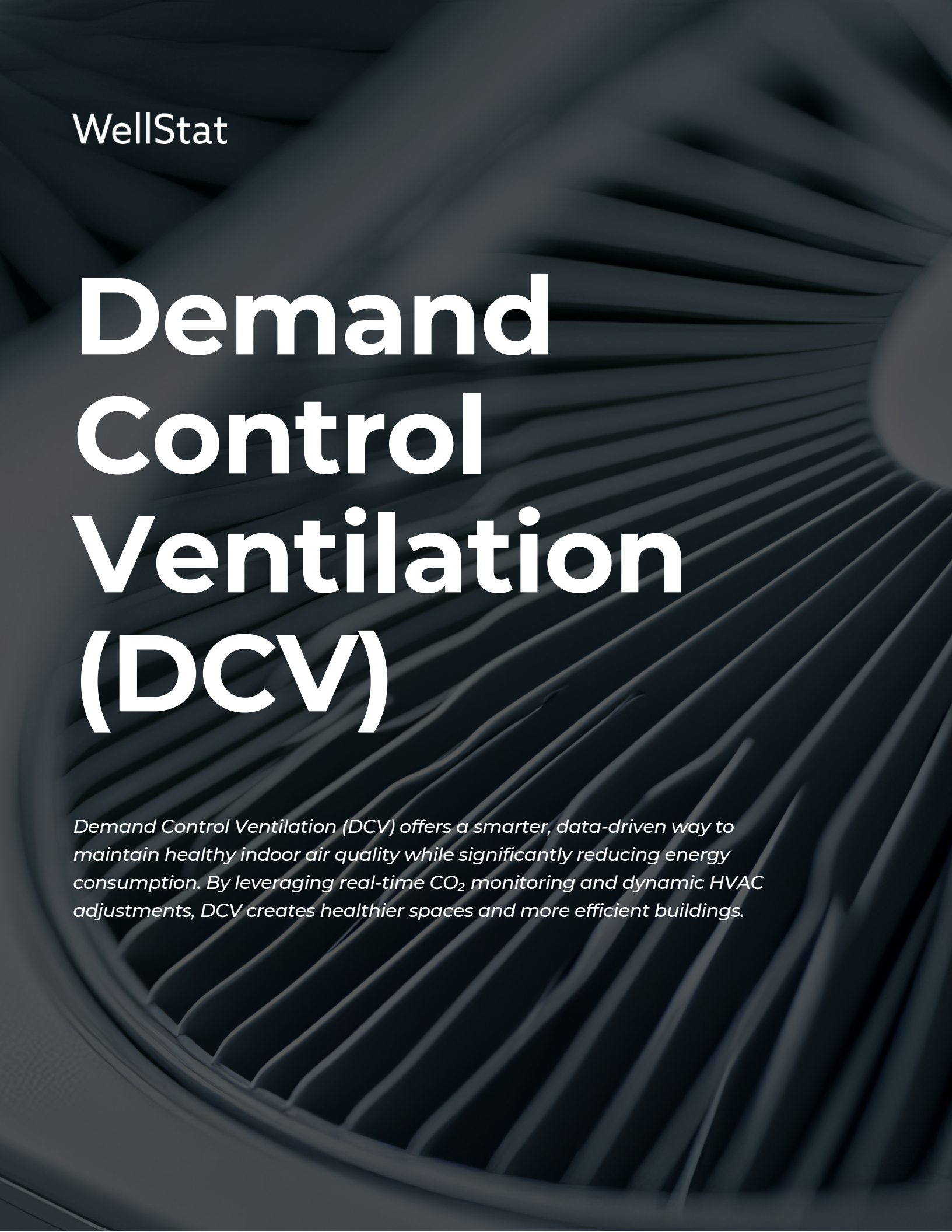




WellStat

Demand Control Ventilation (DCV)

Demand Control Ventilation (DCV) offers a smarter, data-driven way to maintain healthy indoor air quality while significantly reducing energy consumption. By leveraging real-time CO₂ monitoring and dynamic HVAC adjustments, DCV creates healthier spaces and more efficient buildings.

The Role of Ventilation in HVAC

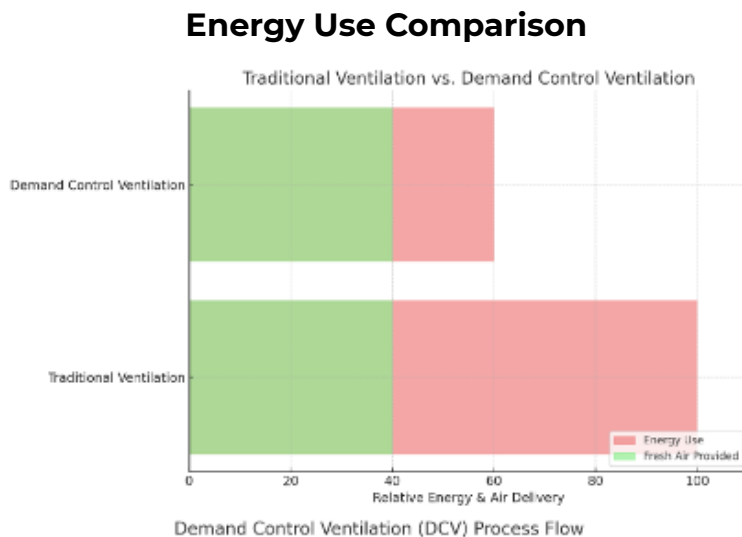
Ventilation is one of the most important aspects of an HVAC system, as it constantly flushes CO₂ build-ups in the building and introduces fresh oxygen. This ensures a healthy environment that promotes cognitive function and diminishes adverse health effects caused by high levels of CO₂.

Ventilation is also one of the most energy-taxing aspects of an HVAC system. Since outside air is untreated, the HVAC system must work very hard to dehumidify, filter, and condition the outside air before it is introduced into the building.

Traditional Ventilation Strategies

The most widely used ventilation strategy utilizes time of day and minimum outdoor air percentages. HVAC systems are programmed to utilize a set percentage of outside air (i.e. 20%) during “occupied” hours.

While this provides consistent ventilation, spaces are often over-ventilated, leading to unnecessary energy expenditure.



Traditional fixed ventilation results in high energy use, while DCV supplies fresh air only as needed.

What is Demand Control Ventilation (DCV)?

Demand Control Ventilation (DCV) is a strategy that utilizes measured CO₂ data instead of fixed scheduling to adequately supply outside air only when occupancy levels require it.

- CO₂ measurements are a direct proxy for occupancy.
- Thresholds can be set on real-time CO₂ values to enable and disable outside air flow.
- Example: If CO₂ levels exceed 800 ppm, ventilation is enabled until CO₂ levels drop below 500 ppm.

Due to the dynamic nature of building occupancy, DCV strategies can yield significant energy savings.

Deployment of DCV

To capture the CO₂ levels of the building, IAQ sensor locations are determined by the existing HVAC infrastructure:

- If a floor’s return air is centralized to one mechanical room → a single sensor can measure CO₂ levels for the entire floor.
- If return air is not centralized → multiple sensors are placed strategically throughout the floor to capture overall CO₂ levels.

The CO₂ data gathered from the sensors are integrated into the HVAC controls system (BMS), where the controls provider sets up thresholds and programming to implement the DCV protocol.

WellStat can provide:

- API integration to BMS, or
- Hardware integration directly via BACnet.

Energy Efficiency Tracking

To track and visualize the energy impact of a DCV strategy rollout, WellStat can implement an Energy Management System (EMS), which tracks utility usage in real time or via API integration with the utility provider.

With EMS data:

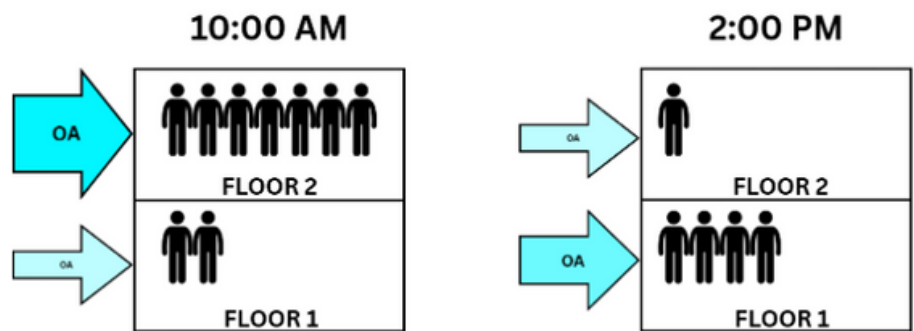
- DCV strategy can be refined using empirical data.
- Factors such as weather, time of day, week, or season can be incorporated for dynamic optimization.

WellStat can also ingest BMS datapoints for more granular audits of DCV impact, including:

- Outdoor air intake temperature
- Damper controls
- Coil temperature
- Other energy-critical datapoints

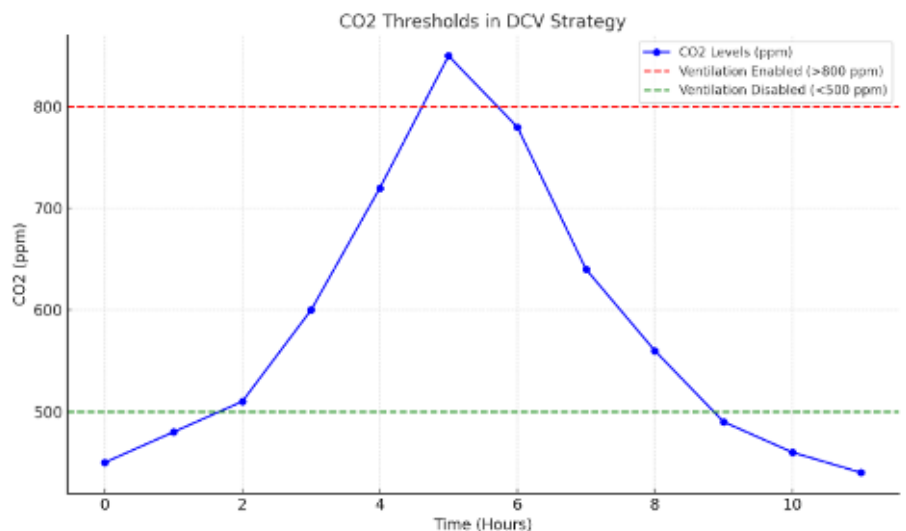
This provides visibility into both CO₂ measurements and energy usage, as well as the mechanical causes of energy impact.

Adaptive Airflow in Action



DCV adjusts outdoor air (OA) supply based on occupancy. When more people occupy a floor, ventilation increases automatically. When occupancy decreases, airflow is reduced, optimizing both air quality and energy use.

CO₂ Threshold Logic



Example of DCV control thresholds. Ventilation activates when CO₂ levels exceed 800 ppm and deactivates once they drop below 500 ppm, maintaining healthy indoor air while conserving energy.

Let's Talk DCV

WellStat makes smarter air management simple: empowering healthier, more sustainable buildings.

Contact us today to get started



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