



Why Aircuity for Exhaust Fan Control

SELECTING THE RIGHT EXHAUST FAN CONTROLS

Why Aircurity

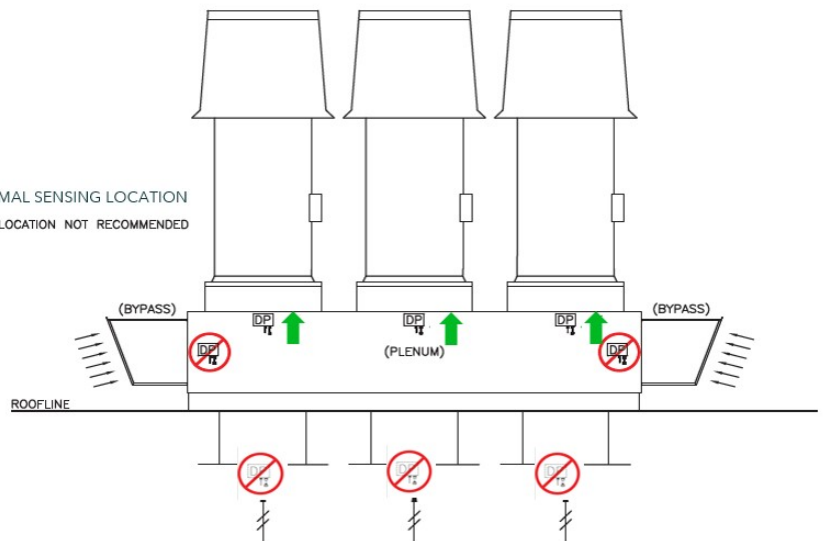
Aircuity pioneered the exhaust fan control application over a decade ago and has been successfully implementing and improving it ever since. Other solutions imitate our design approach but fall short in several key areas that shouldn't be overlooked in such a critical application.

Three very important considerations when deploying effective exhaust fan control are:

1. 85% to 90% of savings come from optimizing ventilation within the building.
2. Exhaust fan savings cannot be maximized without first optimizing ventilation in the building.
3. Always involve a wind engineering professional when implementing dilution ratios lower than 3,000/1 to ensure proper turndown safety measures and mitigate risk.

How Aircurity is Different:

- **Sensor drift is eliminated.** Differential measurement is the critical component only available with Aircurity. This patented approach measures the difference between a clean air location and the exhaust plenum to eliminate sensor drift; one of the most common and concerning aspects of sensing. Without this feature sensor drift will cause:
 - **False Positives** – Exhaust fans will run at higher flows than necessary resulting in tremendous energy waste, reduced operational life and will remove credibility of the application.
 - **False Negatives** – A worse problem where contaminants pass undetected resulting in potentially unsafe re-entrainment of contaminated air into the building supply air.
- **Measure in the fan plenum, not in the risers.**
 - Most accurate sample of blended air.
 - Exhaust riser duct sensing:
 - Inaccurate sample of exhaust if blended with bypass air.
 - Exposes sensors to damaging levels of TVOCs.
- **Redundant TVOC sensing for increased reliability and safety.**
 - Reliability - Aircurity uses redundant TVOC sensors.
 - Safety - Aircurity deploys 2 types of TVOC sensors to detect the widest breadth of contaminants:
 - MOS (Metal Oxide Semiconductor)
 - PID (Photo Ionization Detector)
 - Competing solutions only use PID sensors which can miss certain hazardous chemicals.
- **Title 24 for California** – Aircurity can meet Title 24 requirements. Title 24 will undergo revisions next year and we look forward to future changes as well.



- **Continuously measuring and managing.**
 - Competitive systems install sensors in the exhaust riser exposing them to damaging levels of TVOC's.
 - To reduce damage, they stop the sampling process for up to 20 minutes.
 - This process DOES NOT eliminate exposure:
 - The sensor must first be exposed to exhaust air to send new flow command.
 - If high levels of contaminants are still present – sensor will be over exposed.
 - Over exposure will aggravate sensor drift.
 - Paused sampling results in more energy usage.
 - Paused sampling does not eliminate damaging over exposure.
 - Aircuity's system does not pause the sensing process.
 - Aircuity samples less then every 3 minutes.
 - The system eliminates damaging sensor exposure by delivering air from the exhaust fan plenum to its centralized sensor suite.

- **Redundant Control Signals.**
 - Exhaust fan controls should incorporate both a BACnet or control communication along with a secondary hard wire interface. If a failure condition such as loss of network connectivity is detected by the system, the BACnet control and monitoring points are marked as “unreliable” so the BAS system can detect this and command the high exit velocity setpoint as a failsafe command. Similarly, if an analog output signal is being provided to the BAS, upon detection of a failure by the system, the outputs will be driven to a failsafe level to command the high exit velocity setpoint of the exhaust fan system. These analog output signals shall be reverse acting to provide the high exit velocity setpoint upon a loss of power in the system.

After achieving energy savings through a lab DCV project, Aircuity's exhaust fan application is the final step to ensuring your lab is as efficient as possible.



Aircuity is the 20-year leader in lowering carbon emissions and creating healthier indoor environments. Commercial, institutional and lab building owners can protect occupants, improve employee productivity and wellness, lower operating costs, and verifiably reduce energy use by as much as 60 percent. Headquartered in Newton, MA, Aircuity's solutions have benefited organizations such as Google, Amazon, SUNY, Eli Lilly, Durst Organization, the University of Pennsylvania, and the University of California-Irvine.