

GreenTrol



OAC and EMOAC
Outdoor Airflow Controllers

Light Commercial HVAC

Monitor and Control Outdoor Air Intake Flow Rates

YOUR Outdoor Air Challenges ...

- ▶ System Challenges
 - ▶ Wind pressure effect
 - ▶ Stack pressure effect
 - ▶ Filter loading
 - ▶ Fan speed variations (VAV and multi-speed fan systems)
- ▶ Equipment Challenges
 - ▶ Oversized dampers
 - ▶ Damper hysteresis and deterioration
 - ▶ Damper binding and actuator slippage/failure

YOUR Benefits ...

- ▶ Compensate for system effects!
- ▶ Detect operational problems and failures!
- ▶ Improve thermal comfort and humidity control!
- ▶ Save energy by not over-ventilating!
- ▶ Improve indoor air quality by not under-ventilating!
- ▶ Document ventilation compliance!

Light commercial HVAC systems account for more than 50% of today's heating and ventilating needs. Although energy efficiency ratios have dramatically improved over the past several decades, outdoor air ventilation control has been mostly ignored. Outdoor air is required by code, paramount to acceptable indoor air quality (IAQ) and a prerequisite for thermal comfort. Improperly controlled, these systems often provide unacceptable indoor air quality, waste energy and provide poor temperature/humidity control.

Traditional methods are ineffective in providing the outdoor air required for IAQ and pressurization, the latter which results in often misdiagnosed temperature and humidity control issues. Traditional methods can result in ventilation error in excess of 50%!

Traditional Methods:

- ▶ Rely on fixed damper position or fan speed to maintain outdoor airflow rates.
- ▶ Vary outdoor airflow rates to maintain a maximum CO₂ level.
- ▶ Use the ratio of outdoor, return and mixed air temperatures to estimate outdoor airflow rates.

The answer is to directly measure and control outdoor airflow rates, even when CO₂-DCV is desired. This method has been used on larger systems for over 25 years. The problem is that accurate outdoor airflow measurement requires high performance thermal airflow sensors that are traditionally cost prohibitive on the light commercial equipment. That is, until NOW!

GreenTrol started in 2009 by a group of investors and designers of EBTRON, a leader in thermal dispersion airflow measurement since 1984. GreenTrol's mission is to develop application specific controllers with integrated sensors at an affordable price. Today's product offering is the result of over 30 years of experience in design, manufacturing and control. Products are ideal for light commercial systems and offers designers and owners a true, cost-effective solution for outdoor air control.

GreenTrol offers a wide range of airflow measurement devices and application specific airflow controllers. The Company also manufactures CO₂ sensor systems and occupancy counters so it can offer a turn-key single source solution for today's smaller HVAC systems.

Packaged Unit Solutions

Ideal for ducted, hooded and louvered intakes up to 8 sq ft



OAC Series

Non-economizer Systems

- Control is triggered by a thermostat or two-position actuator signal (replace two position actuator with proportional actuator)
- Models available for proportional or MP-bus actuators
- Available with integrated airflow probes or approved BACnet third-party airflow measurement devices
- Supports approved BACnet CO₂ sensors and occupancy counters and most analog CO₂ sensors
- Models available with built-in schedule capability

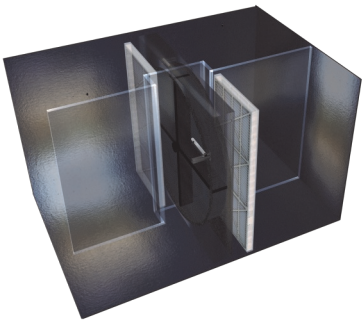
EMOAC Series

Economizer Systems

- Control is triggered by economizer controller (by others) actuator signal
- Requires a proportional actuator
- Available with integrated airflow probes or approved BACnet third-party airflow measurement devices
- Supports approved BACnet CO₂ sensors and occupancy counters
- Supports most analog CO₂ sensors if the economizer fault signal is not required

ERV/HRV Solutions

Ideal for duct and cabinet openings up to 8 sq ft



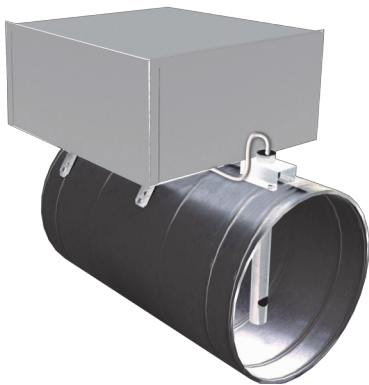
OAC, TRACK and OACTRACK Series

Intake and/or exhaust paths of ERV/HRV units

- Control can be triggered by an analog binary output or via MS/TP BACnet
- Provide outdoor airflow control (OAC), exhaust fan tracking (TRACK) or both (OACTRACK)
- Available with integrated airflow probes or approved BACnet third-party airflow measurement devices
- Supports approved BACnet CO₂ sensors and occupancy counters and most analog CO₂ sensors

Round Duct Solutions

Designed for 4 to 16 inch round



OAC Series

Intakes to Fan Coils

- Control is typically triggered by a thermostat
- Models available for proportional or MP-bus actuators
- Available with integrated airflow probes or approved BACnet third-party airflow measurement devices
- Supports approved BACnet CO₂ sensors and occupancy counters and most analog CO₂ sensors
- Models available with built-in schedule capability
- Factory assembled valve/actuator option (shown) available

OAC Series

DOAS/Makeup Air Units

- Control can be triggered by an analog binary output or via MS/TP BACnet
- Models available for proportional or MP-bus actuators
- Available with integrated airflow probes or approved BACnet third-party airflow measurement devices
- Supports approved BACnet CO₂ sensors and occupancy counters and most analog CO₂ sensors
- Models available with built-in schedule capability
- Factory assembled valve/actuator model (shown) available

A Superior Solution for an Epidemic Problem ...

Today's light commercial systems simply cannot provide the proper amount of outdoor air. Wind and stack pressure variations combined with filter loading result in outdoor airflow variations in excess of 50% of the desired setpoint, often even more when systems vary fan speed. Combine that with oversized and poor quality dampers and you have all of the ingredients for an IAQ and energy problem in epidemic proportions!

There really has been no viable or cost effective solution for these systems - until now!

A properly installed GreenTrol Automation application specific controller for outdoor air will improve air quality and thermal comfort while optimizing energy consumption.

Don't wait any longer. All GreenTrol outdoor air controllers boast the following features:

- ▶ Time-tested thermal dispersion airflow measurement technology!
- ▶ Low-cost!
- ▶ Easy to install and startup!
- ▶ MS/TP BACnet Interface!
- ▶ Unsurpassed control flexibility supports:
 - ▶ Fixed setpoint airflow control
 - ▶ Improved CO₂-DCV with upper and lower airflow limits
 - ▶ Advanced population-based DCV
 - ▶ Optional unoccupied airflow setpoint control operation

Learn more about GreenTrol's Family of Products
Visit GreenTrol.com Today!



Airflow/Temperature Measurement



Occupancy Counters



Transmitters, Controllers, Alarms & Bridges



Duct & Wall Mount CO₂ Measurement