

# GreenTrol



## OAC SERIES

Fixed Setpoint/DCV Outdoor Airflow Controllers

Includes an Integral Thermal Dispersion Airflow Measurement Device

# Turn-key Outdoor Airflow Control

Ideal for smaller AHUs, makeup air units, and DCV systems

## Your System Challenges ...

- ▶ Compensate for wind and stack effect
- ▶ Compensate for filter loading
- ▶ Compensate for fan speed variations (VAV systems, multi-speed fan systems, and DOAS)
- ▶ Compensate for damper hysteresis, deterioration, binding, and/or actuator slippage/failure
- ▶ Compensate for multizone DOAS DCV system duct pressure variations
- ▶ Maintain minimum and maximum DCV ventilation limits

## Your Benefits ...

- ▶ Overcome system challenges!
- ▶ Save energy by not over-ventilating!
- ▶ Improve indoor air quality by not under-ventilating!
- ▶ Facilitate IRMM switchover
- ▶ Improve thermal comfort and humidity control!
- ▶ Improve DCV operation and satisfy the new requirements of ASHRAE 62.1-2022
- ▶ Document code compliance!
- ▶ Detect operational problems and failures!

GreenTrol Automation has been providing application specific controllers with integrated thermal dispersion airflow measurement devices since 2009. The OAC Series product line provides a turn-key outdoor airflow control solution for smaller AHUs, makeup air units, and DCV systems (single and multi-zone).

Outdoor air is required by code, paramount to acceptable indoor air quality (IAQ), and a prerequisite for thermal comfort. Improperly controlled systems often result in unacceptable indoor air quality, wasted energy, and poor temperature/humidity control.

## Traditional Methods

Traditional outdoor air delivery control methods rely on damper position and/or fan speed to maintain outdoor airflow rates. These methods are ineffective in providing the outdoor air required for IAQ and pressurization and result in ventilation error in excess of 50%!

Damper position and/or reset based on fan speed cannot compensate for wind, stack, or filter loading pressure changes on the intake system. Damper hysteresis, binding, and actuator slippage/failure often goes undetected for years. The result is increased energy consumption, poor IAQ, or both.

Variable occupancy spaces often adjust the outdoor airflow rate based on the CO<sub>2</sub> level of the ventilation zone to save energy. CO<sub>2</sub> is a proxy for the outdoor air ventilation rate per person and not a direct measure of indoor air quality as many wrongly assume. CO<sub>2</sub>-DCV ventilation rates are significantly affected by CO<sub>2</sub> measurement error, the CO<sub>2</sub> production rate of the individuals, and lag (i.e., the assumption of steady-state). As a result, traditional CO<sub>2</sub>-DCV that maintains CO<sub>2</sub> levels in a ventilation zone at or below a specified level (typically 1,000 ppm), often results in underventilation at low occupancy levels and overventilation at design occupancy levels. Most CO<sub>2</sub>-DCV systems today do not provide the ventilation rates required by ASHRAE 62.1 and building codes during operation. In addition, traditional CO<sub>2</sub>-DCV control logic is not well suited for switchover to IRMM (Infectious Risk Management Mode) operation when conditions warrant such operation. ASHRAE 62.1-2022 recently changed its requirements for CO<sub>2</sub>-DCV operation and no longer recommends single setpoint CO<sub>2</sub> ventilation control.

## GreenTrol Automation's Solution

Provide constant outdoor airflow to low occupant density spaces at all times. Improve traditional CO<sub>2</sub>-DCV or provide an advanced ASHRAE 62.1-2022 compliant DCV strategy on variable occupancy, higher density spaces.

GreenTrol Automation's OAC outdoor airflow controllers boast the following features and benefits:

- ▶ Time-tested integral thermal dispersion airflow measurement device
- ▶ Low-cost
- ▶ Easy to installation and startup
- ▶ MS/TP BACnet Interface
- ▶ Unsurpassed, field configurable, outdoor airflow control logic
  - ▶ Fixed setpoint airflow control
  - ▶ Improved single setpoint (traditional) CO<sub>2</sub>-DCV with controlled upper and lower airflow limits
  - ▶ Supports new ASHRAE 62.1-2022 compliant DCV methods
    - Advanced CO<sub>2</sub>-DCV resets the outdoor airflow setpoint based on the CO<sub>2</sub> level
    - Population-based DCV resets the outdoor airflow setpoint based on the measured population
  - ▶ Optional unoccupied airflow setpoint control operation provides pressurization during unoccupied periods

## Air Handling Unit and Makeup Air Unit Solutions

Ideal for openings up to 8 sq ft

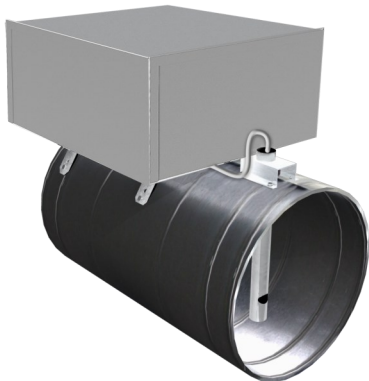


Ideal for Systems without an Airside Economizer

- Control is triggered by a thermostat (or other binary signal), two-position actuator signal (replace two position actuator with proportional actuator), or via BACnet MS/TP
- Models available for proportional actuators or fan speed controllers
- Available with integral thermal dispersion airflow/temperature measurement probes designed to be mounted in the hood or intake duct of recirculating AHUs or in the cabinet or discharge duct of makeup air units.
- Models available that accept analog or BACnet CO<sub>2</sub> sensors or occupancy counters when DCV is required
- Models available with built-in schedule capability

## Ducted Solutions

Ideal for 4 to 16 inch round ducts



Ideal for Ducted Intakes to AHUs, Fan Coils, and DOAS Ventilation Zones

- Control is triggered by a thermostat, binary output, or via BACnet MS/TP
- Models available for proportional or MP-bus actuators
- Available with integral thermal dispersion airflow/temperature measurement probes designed to be mounted in the hood or intake duct of recirculating AHUs or in the cabinet or discharge duct of makeup air units.
- Models available that accept analog or BACnet CO<sub>2</sub> sensors or occupancy counters when DCV is required
- Models available with built-in schedule capability
- Factory assembled valve/actuator option (shown) available

# Integral Airflow Measurement Probe Types



## DI (Duct Insertion Probe)

Typical Application: Indoor Round Ducts (4 to 16 inch diameter)



## UI (Universal Insertion Probe)

Typical Application: Indoor Ducts and Equipment Cabinets



## US (Universal Standoff Probe)

Typical Application: Outdoor Air Intakes and Equipment Cabinets

## Outdoor Air Control Methods

### Fixed Setpoint Control Methods

FLOW: Maintains a user specified outdoor airflow setpoint during occupied periods.

### Demand Control Ventilation (DCV) Methods

CO<sub>2</sub>: Maintains a user specified CO<sub>2</sub> level between user defined upper and lower airflow limits during occupied periods. Requires an optional CO<sub>2</sub> sensor by GreenTrol or others.

CO<sub>2</sub>/OAF: Calculates the steady-state population of the ventilation zone based on the measured CO<sub>2</sub> level and airflow rate. Allows for a user specified activity level input. Requires an optional CO<sub>2</sub> sensor by GreenTrol or others.

COUNT: Calculates the required ventilation based on the measured population of the ventilation zone. Requires an optional occupancy counting system from GreenTrol or others.

## Model Selection Chart

MODEL	SENSOR INPUTS			CONTROL FUNCTIONS				CONTROL OUTPUT			NET
Controller Model + Probe Type	Compatible Integral Airflow Measurement Probes -{type}	Optional CO <sub>2</sub> Sensor Type	Optional Occupancy Counter Type	Occupied Mode OA Control Method	UNOC Mode OA Control	Real Time Clock Scheduler	Occupied Mode "Enable" Source	Control Signal	Relay	Airflow Signal Output	RS-485 MS/TP Connection
OAC-3000-{type}	DI (Duct Insertion)	None	None	FLOW	Off or UNOC Airflow Setpoint Control	No	AC/DC BO or MS/TP <sup>2</sup>	GreenTrol MP-bus Actuator (by Belimo)	N.O. Assignable to Alarms or Mode	None	Yes <sup>2</sup>
	UI (Universal Insertion)	MS/TP		CO <sub>2</sub>							
	US (Universal Standoff)	None		COUNT							
OAC-3000S-{type}	DI (Duct Insertion)	None	None	FLOW	Off or UNOC Airflow Setpoint Control	Yes	AC/DC BO or MS/TP <sup>2</sup>	GreenTrol MP-bus Actuator (by Belimo)	N.O. Assignable to Alarms or Mode	None	Yes <sup>2</sup>
	UI (Universal Insertion)	MS/TP		CO <sub>2</sub>							
	US (Universal Standoff)	None		COUNT							
OAC-4000-{type}	DI (Duct Insertion)	None	None	FLOW	Off or UNOC Airflow Setpoint Control	No	AC/DC BO or MS/TP <sup>2</sup>	Analog <sup>1</sup>	N.O. Assignable to Alarms or Mode	None	Yes <sup>2</sup>
	UI (Universal Insertion)	MS/TP		CO <sub>2</sub>							
	US (Universal Standoff)	None		COUNT							
OAC-5000-{type}	DI (Duct Insertion)	None	None	FLOW	Off or UNOC Airflow Setpoint Control	No	AC/DC BO or MS/TP <sup>2</sup>	Analog <sup>1</sup>	N.O. Assignable to Alarms or Mode	Analog <sup>1</sup>	Yes <sup>2</sup>
	UI (Universal Insertion)	MS/TP or Analog		CO <sub>2</sub>							
	US (Universal Standoff)	None		COUNT							

Notes:

<sup>1</sup> 0-5, 0-10, 1-5 and 2-10 VDC output signals are provided. 1-5/2-10 VDC output signals can drive a 4-20mA input circuit.

<sup>2</sup> The RS-485 MS/TP connection is non-isolated. Provide a separate 24 VAC transformer for the Building Automation System (BAS).

**Learn more about GreenTrol Automation's Family of Products**  
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