

## Outdoor Airflow Controller Module with Network Control Connection for MP-Bus Actuators



- √ Compensate for damper hysteresis, filter loading, wind, stack and fan speed variations
- √ Provide continuous verification of intake flow rates
- √ Demonstrate compliance with ASHRAE Standards 62.1, 90.1 and 189.1
- √ Satisfy LEED prerequisites and document code compliance
- √ Improve indoor air quality and thermal comfort
- √ Save energy

The OAC-3000S can be provided with a single integrated IAT-DI duct probe, one or two integrated IAT-UI or IAT-US universal mount probes or an approved external BACnet MS/TP airflow measurement device.

The OAC-3000S interfaces with approved MS/TP BACnet CO<sub>2</sub> sensors and occupancy counters when DCV is required.

- Compatible with GreenTrol IAT integrated thermal dispersion airflow/temperature sensors or approved BACnet MS/TP airflow measuring devices
- 24 VAC/DC or MS/TP BACnet binary input activates occupied mode operation
- RTC occupied/unoccupied scheduler**
- Provide airflow setpoint control, CO<sub>2</sub>-DCV or population based-DCV during occupied mode
- Accepts approved BACnet MS/TP CO<sub>2</sub> sensors or occupancy counters when DCV is required
- Clamp DCV airflow rates between minimum and maximum airflow limits
- Supports unoccupied airflow setpoint control
- Built-in notification alarms
- Contact closure relay can be assigned to notification alarms or active control mode

The OAC-3000S modulates an MP-Bus damper actuator to maintain the outdoor airflow rate. The controller can be configured to operate solely on the schedule or use the schedule with the binary input trigger to activate occupied mode. The binary trigger is typically provided by a thermostat or other analog or MS/TP BACnet binary output. The trigger can also be provided by the 24 VAC control signal used when a two-position actuator is provided for outdoor air control (replace the two-position actuator with an MP-bus actuator).

Advanced logic and airflow measurement improves traditional CO<sub>2</sub>-DCV when demand control ventilation is required. The OAC-3000S controller resets the outdoor airflow setpoint between user defined minimum and maximum airflow limits to maintain either a user defined fixed CO<sub>2</sub> level or variable airflow setpoint based on the population using a built-in CO<sub>2</sub>/airflow counting algorithm or external occupancy counter.

The OAC-3000S interfaces with most MS/TP BACnet building automation systems and supports full read/write privileges as a BACnet 1/8 load master. An RS-485 signal isolator is available when an isolated MS/TP network is required.

# OAC-3000S Controller Module Technical Specifications

## Functionality

### Outdoor Air Control (OAC) Modes Supported

- FLOW:** Maintains a user defined airflow setpoint
- CO2:** Maintains a user defined CO<sub>2</sub> level by resetting the outdoor airflow setpoint (requires a CO<sub>2</sub> sensor)
- CO2/OAF:** Maintains a calculated outdoor airflow setpoint based on the estimated ventilation zone population (requires a CO<sub>2</sub> sensor)
- COUNT:** Maintains a calculated outdoor airflow setpoint based on the occupancy counter population (requires an occupancy counter)
- FIXED:** Maintains a fixed damper position (no control)

**Unoccupied Air Control (UAC) Mode Option:** Yes, maintains a user defined airflow setpoint

### Notification Alarms

- "Unoccupied Mode" High/Low Airflow Alarm
- "Outdoor Airflow Mode" High/Low Airflow Alarm
- "All Modes" CO<sub>2</sub> Alarm (requires a CO<sub>2</sub> sensor)
- "All Modes" System Trouble Alarm

*Note: Alarms can be assigned to the contact closure relay*

### Built-in RTC Scheduler Modes:

- Off:** No schedule set
- Days:** Allows s different occupied start time and duration for each day of the week
- Weeks:** Allows a different occupied start time and duration for weekdays and weekends

## User Interface

- Display:** 16-character alpha-numeric LCD
- Navigation:** 4-button interface

## Integrated Sensor Capability

**Type:** Accepts GreenTrol IAT-DI, IAT-UI and IAT-US Thermal Dispersion Airflow and Temperature Measurement Probe (required unless an external MS/TP airflow measurement device is provided). See appropriate IAT product data sheet for probe information.

### Available Configurations: IAT-DI Probes

**Single Probe:** 1 probe x 1 or 2 sensor nodes/probe

### Available Configurations: IAT-UI and IAT-US Probes

- Single Probe:** 1 probe x 1 sensor node/probe
- Dual Probe:** 2 probes x 1 sensor node/probe

## Binary Input

### BI1

- Type:** Binary Input (BI1)
- Assignment:** Mode activation trigger signal
- Configurable Ranges:** 0-24VAC or 0-24VDC
- Trigger Threshold:**
  - VAC configuration:** 6.5 VAC
  - VDC Configuration:** 8 VDC

## MP-Bus Output

### MP1

**Assignment:** MP-Bus proportional actuator network signal (requires MP-bus cable, sold separately)

## Contact Closure Relay

### R1

- Type:** Dry contact w/ onboard jumper to drive a remote LED
- Assignment:** OAC alarms or Control Mode
- Status:** Normally Open (N.O.)
- Rating:** 30 VDC or 24 VAC @ 3 amp. max.

## Network Connection

### N1

- Type:** Non-isolated MS/TP BACnet master connection (provide an RS-485 network isolator if isolation is required)
- B.A.S. Object Read/Write Access:** Yes
- Device Load:** 1/8 load
- Supported Baud Rates:** 9.6, 19.2, 38.4 and 76.8 kbaud
- MS/TP BACnet Airflow Sensor Capability:** One GreenTrol Automation or approved third-party airflow measurement device (cannot be used if an integrated airflow measurement device is connected).
- MS/TP BACnet CO<sub>2</sub> Sensor Capability:** One GreenTrol Automation or approved third-party space mounted or return air CO<sub>2</sub> sensor
- MS/TP BACnet Occupancy Counter Capability:** One to four GreenTrol Automation or approved third-party occupancy counters

## Environmental Limits, Power Requirements & Dimensions

### Environmental Limits

- Temperature:** -20 to 120 °F [-28.9 to 48.9 °C]
- Humidity:** 5 to 95%

*Important: Provide a weather-proof enclosure if the controller module is mounted outdoors*

- Power Requirement:** 24 VAC (22.8 to 26.4 under load) @8.5V-A
- Dimensions:** 4.34H x 6.59W x 1.83D in. [110.2 x 167.3 x 46.6 mm]

## Insertion Mount Thermal Dispersion Airflow/Temperature Measurement Probe for Round Ducts



- Compatible with GreenTrol transmitters and controllers that accept IAT integrated sensors
- Thermal dispersion technology
- Calibrated from 0 to 3,000 FPM
- Stable bead-in-glass thermistor sensors
- NIST traceable airflow and temperature measurement
- Calibrated to volumetric airflow standards
- Accurate and repeatable
- Field calibration is not required
- Fits standard 4 to 16 inch round ducts
- Easy to install insertion probe design
- Available in aluminum or stainless steel
- FEP plenum rated cable with terminal DIN connector plug provided

### Typical Installations:

- Hospital, laboratory and clean room ducts
- Terminal boxes
- Outdoor air intakes to fan coils
- Makeup air ducts to air handlers

IAT (integrated airflow/temperature) sensors reduce cost by eliminating the redundancy of a separate transmitter for airflow and temperature measurement. The processing circuitry and firmware is integrated into one of GreenTrol's microprocessor-based transmitters or application specific controllers.

The IAT-DI airflow/temperature sensor is designed for duct insertion applications. Probes are available with one or two sensor nodes. Installed airflow accuracy is  $\pm 4\%$  of reading to NIST traceable standards when installed in accordance to published placement guidelines.

The IAT-DI sensor probe uses the principle of thermal dispersion to determine the airflow rate. Thermal dispersion is ideal for HVAC applications that typically require measurement

of low air velocities. Each sensing node uses two thermistors to determine airflow. One thermistor is self-heated above ambient while a second thermistor determines the ambient air temperature. The power dissipated into the airstream is directly related to the airflow rate.

Each thermistor body is a hermetically sealed bead-in-glass probe. Bead-in-glass thermistors have demonstrated extreme stability and superior performance over chip type thermistors used by other manufacturers. The bead-in-glass sensor used has been time tested for over 35 years by GreenTrol's sister company, EBTRON. Thermistors are potted in a waterproof sensor assembly and are designed for years of trouble-free operation.

Each sensing node is individually calibrated at 7 points in high-performance wind tunnels. Transmitters and controllers measure and process each individual sensor node independently. The result is the true average airflow rate and temperature when more than one sensing node is applied.

# IAT-DI Technical Specifications

## Functionality

**Airflow Measurement:** Provides individual sensor node airflow rates to compatible GreenTrol transmitters and controllers

**Temperature Measurement:** Provides individual sensor node temperatures to compatible GreenTrol transmitters and controllers

## Airflow/Temperature Measurement Probe

**Type:** -DI Duct Insertion Thermal Dispersion Airflow and Temperature Measurement Probe

### Available Configurations

**4 inch [102 mm]:** 1 probe x 1 sensor node

**5 to 16 inch [127 to 406 mm]:** 1 probe x 2 sensor nodes

### Sensing Node Sensors

**Self-heated sensor:** Precision, hermetically sealed, bead-in-glass thermistor probe

**Temperature sensor:** Precision, hermetically sealed, bead-in-glass thermistor probe

### Probe Tube

**Material:** Mill finish 6063 aluminum (optional: 316 SS)

### Probe Mounting Brackets

**Material:** 304 stainless steel

### Probe Mounting: Insertion

### Sensing Node Housing

**Material:** Glass-filled Polypropylene

**Sensor Potting Materials:** Waterproof marine epoxy

### Sensing Node Internal Wiring

**Material:** Kynar® coated copper

### Probe to Transmitter Cables

**Material:** FEP jacket, plenum rated CMP/CL2P, UL/cUL listed, -67 to 392 °F [-55 to 200 °C], UV tolerant

**Standard Lengths:** 3, 10, 25 and 50 ft. [0.91, 3.1, 7.6 and 15.2 m]

**Connecting Plug:** 0.60" [15.24 mm] nominal diameter

### Airflow Measurement

**Averaging Method:** Independent, arithmetic average

**Installed Accuracy:** Better than ±4% of reading to NIST traceable airflow standards

**Calibrated Range:** 0 to 3,000 fpm [0 to 15.24 m/s]

**Calibration Points:** 7

### Temperature Measurement

**Averaging Method:** Independent, velocity weighted

**Accuracy:** ±0.15°F [0.08 °C]

## Environmental Limits & Power Requirements

### Environmental Limits

**Temperature:** -20 to 160 °F [-28.9 to 71.1 °C]

*Note: Temperature limits for operation may be limited by the transmitter or controller selected*

**Humidity:** 0 to 100%

**Power Requirement:** Power is provided by the transmitter or controller and is included in the transmitter/controller power requirement specification