OAC-3000 Controller

Product Data

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

❑ 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

❑ Provide airflow setpoint control, CO_2-DCV or population based-DCV during occupied mode

❑ Accepts approved BACnet MS/TP CO_2 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

❑ MS/TP BACnet connection

√ 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-3000 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-3000 interfaces with approved MS/TP BACnet CO_2 sensors and occupancy counters when DCV is required.

The OAC-3000 modulates a network MP-bus actuator to maintain the outdoor airflow rate when an external binary trigger is active (i.e. occupied mode). The binary trigger is typically is 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_2-DCV when demand control ventilation is required. The OAC-3000 controller resets the outdoor airflow setpoint between user defined minimum and maximum airflow limits to maintain either a user defined fixed CO_2 level or variable airflow setpoint based on the population using a built-in CO_2/airflow counting algorithm or external occupancy counter.

The OAC-3000 controller 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-3000_ProductData_r1a

OAC-3000 Controller Module Technical Specifications

Functionality

Outdoor Air Control (OAC) Modes Supported

FLOW: Maintains a user defined airflow setpoint

CO2: Maintains a user defined CO_2 level by resetting the outdoor airflow setpoint (requires a CO_2 sensor)

CO2/OAF: Maintains a calculated outdoor airflow setpoint based on the estimated ventilation zone population (requires a CO_2 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_2 Alarm (requires a CO_2 sensor)

"All Modes" System Trouble Alarm

Note: Alarms can be assigned to the contact closure relay

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 Connection

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_2 Sensor Capability: One GreenTrol Automation or approved third-party space mounted or return air CO_2 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 ^{0}F [-28.9 to 48.9 ^{0}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:

IAT-UI Probe
Product Data

Universal Insertion Mount Thermal Dispersion Airflow/Temperature Measurement Probe for 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
- ❑ Accurate and repeatable
- ❑ Designed for openings up to 8 square feet
- ❑ Universal mounting design facilitates ordering and installation
- ❑ Three probe lengths available
- ❑ Aluminum probe construction
- ❑ FEP plenum rated cable with terminal DIN connector plug provided

Typical Installations:

- Rectangular, round and oval interior supply, return, exhaust and outdoor air intake ducts

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-UI airflow/temperature sensor is designed for insertion mounting into interior ducts (ducts protected from rain and/or snow). One or two probes with a single sensor node are typically used. Sensor node airflow accuracy is ±3% of reading to NIST traceable standards. An installed accuracy of ±10% of reading or better can often be achieved without field adjustment. A field adjust wizard built into GreenTrol's transmitters and application specific controllers facilitate field setup when conditions warrant.

The IAT-UI sensor probe uses the principal 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-UI 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: -US Universal Insertion Mount Thermal Dispersion Airflow and Temperature Measurement Probe

Available Configurations

Single Probe: 1 probe x 1 sensor node/probe

Dual Probe: 2 probes x 1 sensor node/probe

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

Probe Mounting Brackets

Material: 304 stainless steel

Probe Length: 6, 8 or 16 in. [152.4, 203.2 or406.4 mm] (adjustable)

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 $^{\circ}$F [-55 to 200 $^{\circ}$C], UV tolerant

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

Connecting Plug: 0.60" [15.24 mm] nominal diameter

Airflow Measurement

Sensor Accuracy: ±3% of reading to NIST-traceable airflow standards

Averaging Method: Independent, arithmetic average

Installed Accuracy: Typically better than ±10% of reading in ducts/ openings ≤ 8 sq ft [0.74 sq m]

Calibrated Range: 0 to 2,000 fpm [0 to 10.16 m/s]

Calibration Points: 7

Temperature Measurement

Averaging Method: Independent, velocity weighted

Accuracy: ±0.15°F [0.08 $^{\circ}$C]

Environmental Limits & Power Requirements

Environmental Limits

Temperature: -20 to 160 $^{\circ}$F [-28.9 to 71.1 $^{\circ}$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