DESCRIPTION

Sequence of Operation

- ❑ Communicate Raw Data to the BMS, Demand-Controlled Ventilation (DCV) signal by others
- ❑ Send DCV signal to the BMS

Sequence Overview for DCV Selection

The AQMS will send a signal to be used to execute DCV to the BMS in response to the differential reading between a clean supply air reference and the greatest reading of sensed indoor contaminants selected above.

The BMS will control the airflow control valves in response to the greatest of three demands:
1. Temperature control
2. DCV command from the AQMS

The temperature controls will operate independent of the AQMS and shall override the DCV signal when required to maintain comfort, space pressurization, and well-being. The AQMS shall provide a signal to be used for DCV that corresponds to the greatest contaminant concentration sensed through the duct probes and/or faceplates.

The sensed contaminants, as selected above, shall be measured against a clean supply air reference point that shares the same sensor pack and is representative of the air being supplied to the space. This methodology cancels sensor drift and provides a differential measurement that is ultimately converted into a DCV signal.

The signal to be used for DCV shall correspond to a ventilation rate that is defined by the BMS. The concentration trigger limit of each contaminant shall be determined by the BMS. Although establishing the limit is not part of Antrum's scope, Antrum, or the Antrum supplier, will participate in meetings or calls with the necessary parties as needed.

- When zone contaminant concentrations sensed by the AQMS are all below their low thresholds as defined by the BMS, the DCV signal shall be 0.
- When zone contaminant concentrations sensed by the AQMS are all at or above their high thresholds as defined by the BMS, the DCV signal shall be 100.
- When zone contaminant concentrations sensed by the AQMS are all between their low and high thresholds as defined by the BMS, the signal shall be between 0 and 100, and shall represent the percentage of contamination, as defined by the thresholds, of the contaminant with the greatest percentage of contamination.

The actual zone ventilation rate shall be dynamic and equal to the higher of the temperature control demand, and the DCV signal from the AQMS.

Table 1 below identifies typical high and low concentration thresholds. Although defined by the BMS, Table 2 is to be completed by the customer.

Table 1: Suggested Contaminant Thresholds

	0	100	%
CO	25	200	ppm
CO_2	400	3,000	ppm
CH_2O	0.5	2.0	ppm
NH_3	25	50	ppm
$PM_{2.5}$	5	15	µg/m^3
TVOC[1]	0.3	3	ppm
TVOC (PID)[1]	0.1	1	ppm

[1]calibrated to isobutylene

Table 2: Contaminant Thresholds

	0	100	%
CO			ppm
CO_2			ppm
CH_2O			ppm
NH_3			ppm
$PM_{2.5}$			µg/m^3
TVOC			ppm
TVOC (PID)			ppm

Test Mode

The AQMS shall come equipped with a test mode that can be entered by writing to the AntrumX Gateway from the BMS (see BACnet point summary). The purpose of entering test mode is primarily for commissioning to allow users to test the functionality of their DCV sequence by passing a preset data package from the AntrumX Gateway to the BMS to ultimately observe the resultant change in ACH. To facilitate this, when test mode is initiated, all contaminant levels will be set to the 100% contaminant level as specified in Table 2. Test mode can be initiated or terminated at any point by resetting the BACnet point.