

DESCRIPTION

Sequence of Operation

The AntrumX AQMS includes a signaling panel which provides four outputs per zone: 24VDC (Alarm), Analog (4-20mA), Low Relay, and High Relay. The outputs are driven based on the greatest contamination of CO or NO₂ from any channel (duct probe or faceplate) in each zone.

A single CO and a single NO₂ sensor are shared among 16 channels. When one of the channels is used as a clean air reference, then differential measurements can be used to completely cancel the effects of sensor drift. Without the clean air reference, the centralized sensing approach still cancels the stacking of errors due to variable sensor drift across multiple sensors.

Gas	Low Setpoint	High Setpoint	Condition	Relays	Analog	Alarm
CO	25-50	100-200	At or Above High Setpoint	High ON Low ON	20mA	ON
			At or Above Low Setpoint, Below High Setpoint	High OFF Low ON	See below	OFF
			Below Low Setpoint	High OFF Low OFF	4mA	OFF
NO ₂	0.1-0.2	1-2	At or Above High Setpoint	High ON Low ON	20mA	ON
			At or Above Low Setpoint, Below High Setpoint	High OFF Low ON	See below	OFF
			Below Low Setpoint	High OFF Low OFF	4mA	OFF

- The setpoints for CO and NO₂ shall be determined by the design engineer and are represented in Table 2

When contaminant concentrations sensed by the AQMS are all below their low setpoints as defined in Table 2, the Analog output shall be 4mA.

When contaminant concentrations sensed by the AQMS are all at or above their high setpoints as defined in Table 2, the Analog output shall be 20mA.

When contaminant concentrations sensed by the AQMS are all between their low and high setpoints as defined in the Table 2, the signal shall be between 4 and 20mA, and shall represent the percentage of contamination of CO or NO₂, as defined by the setpoints, whichever is greatest.

For example, using Table 1 below if the CO concentration was 75ppm then the percent contamination according to CO (see equation 1):

$$(75 - 25) / (200 - 25) = 0.285 = 29\% \text{ Contaminated}$$

(Equation 1)

Additionally, if the NO₂ concentration was 0.14ppm then the percent contamination according to NO₂ (see equation 2):

$$(0.14 - 0.1) / (2 - 0.1) = 0.021 = 2\% \text{ Contaminated}$$

(Equation 2)

Then the Analog output would be 8.64mA, which is driven by CO concentration (see equation 3):

$$29\% * (20-4) + 4 = 8.64\text{mA}$$

(Equation 3)

Alarm Levels

Table 2 is to be completed by the customer.

Table 1: Suggested Contaminant Thresholds

	Low	High	
CO	25-50	100-200	ppm
NO ₂	0.1-0.2	1-2	ppm

Table 2: Contaminant Thresholds

	Low	High	
CO			ppm
NO ₂			ppm