



## **BAS** Application Note 007

### **Setup Calculations for Zone CFM Monitoring**

#### **Rev 1 RSC Only - Determination of Minimum Input Voltage**

For sensors that use an input resistor, a minimum input voltage value must be determined in order to calculate an offset. Determine the minimum voltage at the AI terminal of the RSC as follows:

$$\text{AI Min Volts} = \text{Esensmin} - ((\text{Esensmin} * \text{Rin}) / (\text{Rin} + 46,625))$$

Esensmin = The minimum sensor output voltage as specified by the sensor manufacturer.

Rin = The value in ohms of the input resistor.

#### **Determination of Offset**

The Offset value must be input in the Actuators configuration at each Zone using a CFM sensor.

##### Rev 1 RSC

First determine the minimum voltage from the calculation above.

$$\text{Offset} = 255 * \text{AI MinVolts} / 3.8$$

##### Rev 3 RSC

Rev 3 RSCs use sensors that do not require an input resistor, and the minimum voltage is equal to the voltage as specified by the sensor manufacturer.

$$\text{Offset} = 255 * \text{AI MinVolts} / 5.0$$

AI MinVolts = The Vdc input to the RSC from the sensor corresponding to 0" wcd input.

#### **Determination of BAS K**

The BAS K value is input once in the VAV/VariZone Settings dialog. This value is used System-wide by all Zones.

$$\text{BAS K} = 10,000 * \text{SQR}(\text{Pmax} / (255 - \text{Offset}))$$

Pmax = The top end of the scale, in "wcd, of the pressure sensor being used.

### **Determination of CFM K for VAV Boxes**

The CFM K value must be input in the Actuators configuration at each Zone using a CFM sensor.

Always use the CFM K as provided by the VAV box and/or air flow pick-up tube manufacturer. If that information is not available, then calculate a CFM K using the following:

$$\mathbf{CFM\ K = 4005 * Duct\ Area}$$

Duct Area = the cross sectional area of the duct where the velocity pressure sensor is located. The units of Duct Area are square feet.

For Round Ducts (Diam is in inches)

$$\mathbf{Duct\ Area = (\pi * (Diam/2)^2) / 144}$$

For Square or Rectangular Ducts (Length and Width are in inches)

$$\mathbf{Duct\ Area = (Length * Width) / 144}$$