SECTION 23 09 00 – BUILDING AUTOMATION SYSTEM AND CONTROL FOR HVAC

This is supplemental language for a spec. This is not an all inclusive spec. This is language that is meant to be copied and pasted into an existing spec.

PART 1 - GENERAL

PART 2 - PRODUCTS

2.1 CARBON DIOXIDE SENSING (CO2)

A. Space or Zone Sensing
   1. One wall module in each zone shall take of each type of sensing called for in the sequences of operations. Separate wall devices in one zone for temperature, humidity and CO2 shall not be allowed.
   2. Provide a plain cover, no display, no setpoint change unless called for in the sequences of operations.
   3. CO2 Sensing specifications:
      a. Range: 0-2000ppm
      b. Signal: 4-20mA or digital
      c. Sensing element type: NDIR
      d. Response: < 3 min full scale
      e. CO2 Accuracy: Maximum +/- 50ppm + 2% of reading
      f. CO2 drift: Maximum +/- 5% of range over 5 years
      g. Calibration: Automatic comparison of dual elements
      h. Calibration adjustment: Adjustable bias set at the module
      i. Power: 24Vac or 24Vdc
   4. Where called for in the sequences of operation or shown on the drawings, provide a display on the face of the thermostat cover. The display shall normally show the current sensor readings. If more than one sensor is used, then rotate the display between the readings.
      a. The display shall be an LED, OLED or backlit LCD.
      b. The display shall show the value, units and the occupied /unoccupied status
   5. Where called for in the sequences of operations, provide setpoint adjustment. If not called for in the sequence, then provide a plain cover or lock out the adjustment through settings.
   6. Where called for in the sequences of operation, provide an occupancy override button to allow the user to switch the zone from unoccupied to occupied.
   7. Provide power for the sensor. If a special power module is required, then provide one for each sensor.
   8. Provide cables to run from the wall sensor to the zone controller
      a. Wall sensors shall have a communication plug to allow an operator to plug in a portable interface and communicate with the zone controller to adjust setpoints and settings.
   9. Installation:
      a. All wall modules shall be mounted on an electrical wall box with wire connection in the box.

b. Mount wall modules according to the architectural and engineering plans.
c. If mounting locations are not given on the plans, then mount according to the following:
    1) Sensors with plain covers, no display or adjustments: 60”AFF
    2) Sensors with display and/or adjustments: 48” AFF
    3) Insulate between the sensing elements and the interior of the wall or junction box.
    4) Do not mount where sun can shine on the sensor through a window.
    5) Do not mount where airflow can be stagnant because of furniture or other obstructions.
    6) Do not mount above or near heat sources, such as appliances, PCs, AV equipment, copiers or baseboard heat.

B. Duct or Outside Air Intake Sensing
1. Provide a duct probe sensing module for sensing CO2 levels. Outside air CO2 shall be sensed at an outside air intake duct so that air movement can be maintained over the sensing element.
2. Electrical connections shall be enclosed in a Nema 1, UL listed enclosure. Connection boxes exposed to weather shall have a Nema 4 watertight junction box for connections
3. CO2 Sensing specifications:
    a. Range: 0-2000ppm
    b. Signal: 0-5V, 0-10V, 4-20mA
    c. Sensing element type: NDIR
    d. Response: < 3 min full scale
    e. CO2 Accuracy: Maximum +/- 50ppm + 2% of reading
    f. CO2 drift: Maximum +/- 5% of range over 5 years
    g. Calibration adjustment: Adjustable bias set at the module
    h. Ambient operating ranges: 0 to 100 Deg. F. and 10 to 95% RH noncondensing.
    i. Power: 24Vac or 24Vdc
4. Provide power for the sensor. If a special power module is required, then provide one for each sensor.
5. Installation
    a. Mount sensor in an accessible location for service and replacement.
    b. Probe shall be located where there is consistent, low turbulent airflow when the system is on.
    c. Do not locate probe where it can be exposed to moisture, such as at the outlet of a cooling coil, outlet of a humidifier, or in an intake plenum that is exposed to weather.