

## SECTION 230923 DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC, Dynamic Ventilation Reset Control (DCV) Devices

*Data contained in this guide specification may be placed in the following section, depending on the specifics of the system design, or incorporated within the next higher level controls specifications (230923 DIRECT DIGITAL CONTROL (DDC) SYSTEMS FOR HVAC).*

### PART 2 PRODUCTS

#### 2.1 PRODUCTS INCLUDED IN THIS SECTION

- A. Single-Entry Interior Door Net Occupancy Counter

#### 2.2 ACCEPTABLE MANUFACTURERS

- A. EBTRON, Inc. Model CENSUS - C100, Single-entry interior door occupancy counter (basis of design)
  - 1. Alternatives requesting acceptance as equal less than 60 days prior to bid date or products submitted in non-conformance with the requirements of this specification will not be considered.
    - a. For any product to be considered for substitution, a written section-by-section document shall be submitted to the Engineer before approval will be considered, detailing all exceptions and items of compliance.
- B. Products approved
  - 1. [List approved equals here that comply with ALL requirements of this specification section]

#### 2.3 NETWORK OCCUPANCY COUNTERS

- A. Dual Sensor - Differential Thermal Imaging Counter
  - 1. General
    - a. Provide combination BACnet-MS/TP and Analog Output counting devices for Dynamic Ventilation Reset Controls to be mounting where indicated on the plans and controlling ventilation to occupied zones as populations vary, in compliance with the Ventilation Rate Procedure in §6.27 of ASHRAE 62.1-2013 and 2016.
- B. Counters shall provide data on net zone populations to be used by the host or AHU controller to dynamically calculate the ASHRAE Standard 62.1 Ventilation Rate Procedure as suggested for DCV Single or Multi-zone spaces in ASHRAE Research Project 1547.
  - 1. Each counter shall consist of a center-top door frame mounted counter, each using a dual thermopile differential thermal imaging counters, an integral microprocessor-based design capable of providing net population data to the controls network for use in ventilation reset based on accurately measured real-time zone populations.
  - 2. Counter with steel enclosure shall have an overall size of: 6.12L x 2.94W x 1.36H inches (155.45 x 74.63 x 34.42 mm) and weigh approx. 0.25 lbs. (0.11 kgs)
  - 3. Counters shall have an environmental operating range of no less than 65° F to 85° F (-9.4°C – 30°C) and 5% – 95% RH, non-condensing.
- C. Population Counter Design and Counting Performance
  - 1. Counter shall be mounted to provide zone entry and exit data to the network for maintenance of a net zone population value to less than ±5% of actual or ±3 people, whichever is larger.
  - 2. Counter design shall be optimized for single entry/exit interior doors, ≤ 42 x ≤ 96 in. (106.7 x 203.2 cm).
  - 2. Small deviations or accumulation in counts shall be adjusted when “population reset interval” is selected during configuration and set up. Upon activation, the total net population in memory shall be ‘zeroed’ based on the user-determined reset period selected or every 24 hours during a predetermined non-occupied period.
- D. Power, Connectivity and Communications
  - 1. The BACnet / analog combination counters shall be capable of communicating with other devices using an RS-485 standard interface and BACnet-MS/TP protocol, implemented as a Master node.
    - a) Communication speed shall be field-selectable by dip switch between 9.6, 19.2, 38.4 and 76.9 kBaud.

2. The counter-network communications shall be capable of field configuration and setup using a simple dip-switch interface.
  3. A simultaneous 0-10 VDC scalable and protected analog output shall also be available to provide net counts.
  4. All counters shall be powered with individual 24 VAC transformers (22.8 to 26.4 under load) @1.2 V-A nominal. Transformers supplied by others.
- F. The manufacturer's authorized representative shall review and approve counter position placement for each location indicated on the plans.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Install thermal counting devices in accordance with manufacturer's instructions at the locations indicated on the plans.
1. A written report shall be submitted to the consulting mechanical engineer if any measurement locations do not meet the manufacturer's recommendations or requirements.

END OF SECTION **23 09 13.23**

Sensors and Transmitters, **Dynamic Ventilation Reset Control and DCV Devices**