Section 23 09 13

Instrumentation and Control Devices for HVAC

Part 1 General

1. 1.1 Summary
   1. Section Includes
      1. This section specifies the furnishing of Big Ass Solutions’ fan automation system for condensation abatement.
      2. Installation of the system, miscellaneous or structural metal work (if required), field electrical wiring, cable, conduit, fuses and disconnect switches, other than those addressed in the installation scope of work, shall be provided by others. Factory installation services are available through Big Ass Solutions. Consult the appropriate installation scope of work for information on the available factory installation options, overview of customer and installer responsibilities, and details on installation site requirements.
2. 1.2 Related Requirements
   1. 23 00 00 Heating, Ventilating, and Air Conditioning (HVAC)
   2. 23 34 00 HVAC Fans
   3. 25 00 00 Integrated Automation
   4. 25 10 00 Integrated Automation Network Equipment
   5. 25 90 00 Integrated Automation Control Sequences
   6. 26 00 00 Electrical
3. 1.3 References
   1. Electronic Industries Alliance (EIA)
   2. International Organization for Standardization (ISO)
   3. National Electrical Code (NEC)
   4. National Electrical Manufacturers Association (NEMA)
   5. National Fire Protection Agency (NFPA)
   6. Occupational Safety and Health Administration (OSHA)
   7. Telecommunications Industry Association (TIA)
4. 1.4 Submittals
   1. Shop Drawings: Drawings detailing product dimensions, weight, and attachment methods.
   2. Product Data: Specification sheets identifying electrical and installation requirements, along with features and benefits.
   3. Revit Files: File provided for architectural design
   4. Product Documentation: The manufacturer shall furnish a copy of all installation, operation, and maintenance instructions for the fan. All data is subject to change without notice.
   5. Schedule
5. 1.5 Quality assurance
   1. Manufacturer Certification: The manufacturer shall be ISO 9001-compliant and shall have a minimum of ten (10) years of product experience.
   2. Product Standards: The system shall be constructed in accordance with UL 508A standards and shall be installed per *NFPA 70: National Electrical Code*.
6. 1.6 Delivery, storage, and handling
   1. The product shall be delivered in original, undamaged packaging with identification labels intact. The product and any accessories shall be new, free from defects, and factory tested.
   2. The product and any accessories must be stored in a safe, dry location, protected from both the weather and construction debris, until installation.
7. 1.7 Warranty
   1. The manufacturer shall replace any products or components defective in material or workmanship for the customer free of charge (including transportation charges within the USA, FOB Lexington, KY), pursuant to the complete terms and conditions of the Big Ass Solutions Non-Prorated Warranty in accordance to the following schedule.

Parts: 1 year\*

\*Warranty information provided here applies to new units only and does not pertain to demo units.

Part 2 Product

1. 2.1 Manufacturer
   1. Delta T Corporation, dba Big Ass Solutions, PO Box 11307, Lexington, Kentucky 40575.  
      Phone (877) 244-3267. Fax (859) 233 0139. Website: www.bigassfans.com.
2. 2.2 Description
   1. Complete unit
      1. Purpose: The Dewtect system shall monitor ambient conditions and reduce the risk of a condensation event, using high volume, low speed Big Ass Fans to automatically adjust surface temperatures based on ambient indoor and outdoor temperature, humidity, and dew point.
      2. Regulatory Requirements: Dewtect shall be constructed in accordance with UL 508A standards and shall be installed per NFPA 70.
      3. Quality: Good workmanship shall be evident in all aspects of construction and installation.
   2. System control cabinet
      1. The Dewtect system control cabinet shall be a NEMA 4/12 enclosure. The cabinet shall not be mounted in direct sunlight.
      2. The control cabinet shall contain the system’s programmable logic controller (PLC), power supply, and touch screen.
      3. Power supply: The control unit shall require single-phase power at either 120/240 VAC, 50–60 Hz or 480 VAC, 50–60 Hz, as specified by the architect or owner.
      4. Touch screen
         1. Dewtect shall support operator input using a 7-inch color touch screen on the outside of the control cabinet.
         2. The touch screen shall have a password login setting to prevent access by unauthorized persons.
         3. The touch screen shall allow an operator to configure sensors, adjust system settings, monitor the system in real time, log data to USB Flash storage, and perform fan and system troubleshooting.
   3. Sensors
      1. Air temperature and humidity sensor: The air temperature and humidity sensor shall be rated an IP65 watertight enclosure, and shall be suitable for ambient temperatures of -30 to 85°C (-22 to 185°F).
      2. Surface temperature sensor: The surface temperature sensor shall be an adhesive thermocouple affixed to the surface.
   4. Fan communication components
      1. The system shall utilize a Modbus RTU for communication with Big Ass Fans over a two-wire RS-485 network. The gateway shall come with one 120 Ω, ¼ W resistor for end of line termination and two 680 Ω, ¼ W resistors for proper line biasing (where required).
      2. A Modbus cable is required to connect Big Ass Fans to the control system. The cable shall meet and shall be installed per TIA/EIA-485 standards for use on RS-485 networks.
      3. Depending on the models of fans being integrated into the system, the fans shall include one or more of the following:
         1. Modbus communication card and 120 Ω, ¼ W resistor. One communication card shall be installed in each Lenze SMVector fan VFD connected to the control system.
         2. RJ45 to Modbus connector and 120 Ω, ¼ W resistor. One connector shall be installed in each Delta E series fan VFD connected to the control system.
      4. If desired, a remote operator station may be installed to switch between Dewtect and local fan control. One remote operator station is required for each fan that shall be locally controlled.
      5. The system shall include a BACnet communication module, which permits monitoring and control of the system.
         1. CAT5 cable is required between the Dewtect enclosure and the Local Area Network for BACnet/IP communications.
         2. A cable suitable for TIA/EIA-485 installation shall be utilized for MS/TP communications.

Part 3 Execution

1. 3.1 Preparation
   1. Before Dewtect is installed, the fans and respective wall controllers shall be installed by a factory-certified installer according to the instructions in the fan Installation Guide. This shall provide a backup means of fan control.
2. 3.2 Installation
   1. Dewtect shall be installed by a factory-certified installer according to the manufacturer’s Installation Guide.
   2. Installation areas shall be free of obstructions such as lights, cables, sprinklers, or other building structures.
   3. The Dewtect system control cabinet and temperature sensors shall be mounted to flat surfaces that are free from vibration and where there is adequate distance from foreign objects or moving equipment. The mounting location of the system control enclosure shall meet the requirements of OSHA standard 29 CFR 1910.303(g).
   4. The Dewtect system control cabinet shall not be mounted in direct sunlight.
   5. Indoor temperature sensors shall not be mounted adjacent to or above radiant heaters, near HVAC ventilation intakes or exhausts, on poorly insulated exterior walls, in roof decking, or near radiant heat sources, and shall be mounted so that they are exposed adequately to circulated air.
   6. Sensors shall operate via 4–20 mA current loop and shall properly operate at distances up to 5000 ft (1500 m) when installed using 20 AWG shielded low-voltage control cable.
   7. Additional installation instructions shall be found in the Installation Guide.
3. 3.3 Maintenance
   1. Big Ass Solutions suggests an electrical preventive maintenance program consistent with *NFPA 70B: Recommended Practice for Electrical Equipment Maintenance.*

End of Section