

## **SUBZONE**

### **Automatic Temperature Control Specification**

#### **Section 15950 - Controls and Automation**

##### **PART 1: General**

- 1.1** The automatic temperature controls (ATC) under this section will be supplied and installed in accordance with the General Conditions, Supplementary Conditions, and all Division I General Requirements and Referenced Documents.
- 1.2** The installation of the ATC shall be in accordance with all National, State and Local codes pertaining to this type of work.
- 1.3** All work must comply with Section 15050 – Basic Materials and Methods – and all other Division 15 Sections, as applicable.
- 1.4** The scope shall include furnishing and installing a temperature control system to include remote control panels, temperature control devices, appurtenances, etc. to accomplish specific control sequences specified herein, to provide overheating and freeze protection for HVAC units, sensing and indicating devices, temperature indicating instruments, supporting structures and other required components.
- 1.5** The scope shall include all thermostats, sensors, dampers, actuators, microprocessor central controllers, VAV diffusers, static pressure sensors, fan powered boxes, re-heat products and all other new components of the system requiring connections.

##### **PART 2: General Instructions**

- 2.1** The Building Automation System/Automatic Temperature Control (BAS/ATC) Systems as specified herein shall be provided in their entirety by the BAS/ATC Contractor. The BAS/ATC Contractor shall base his Bid on the system as specified and on the sequence of operations.
- 2.2** As part of his Bid, the BAS/ATC Contractor shall submit for review by the owner's authorized representatives a written description of his BAS/ATC systems, including block diagrams, showing all major components and control panels and required cabling between each.
- 2.3** The BAS/ATC contractor shall include manufacturer's literature for each type of panel, controller, or device that may be shown on the Riser Diagram.
- 2.4** The Riser Diagram shall show schematically the entire building system with all major components identified.

##### **PART 3: Scope of Work**

- 3.1** The BAS/ATC systems shall be supplied and installed completely under the BAS/ATC Contract. Control components shall be mounted and wired by the BAS/ATC Contractor.
- 3.2** The BAS/ATC Contractor shall provide the engineering, installation, calibration, software programming and checkout necessary for complete and fully operational BAS/ATC systems, as specified hereafter.
- 3.3** Wiring in exposed areas and in mechanical rooms shall be in EMT. Wiring in accessible, concealed areas shall be plenum rated cable.

##### **PART 4: Submittals**

- 4.1** The following data/information shall be submitted for approval:
- 4.2** Complete sequence of operation.

- 4.3 Control system drawings, including all pertinent data, to provide a functional operating system.
- 4.4 Damper schedules showing size, configuration, capacity and location of all equipment.
- 4.5 Data sheets for all hardware control components.
- 4.6 A description of the installation materials including conduit, wire, flex, etc.
- 4.7 Thermostat/Sensor locations.
- 4.8 Control panel locations.
- 4.9 Provide as part of the submittal five copies of all data and control drawings.

### **PART 5: Qualifications**

- 5.1 The BAS/ATC Contractor shall have an office within a 100-mile radius of the job site, staffed with factory trained personnel capable of providing instruction, routine maintenance and 24-hour emergency maintenance service for all system components.
- 5.2 The BAS/ATC Contractor shall have a minimum of three years' experience installing and servicing similar microprocessor based control systems.
- 5.3 The Contractor shall be prepared to provide evidence of this history as a condition of acceptance and approval prior to bidding.

### **PART 6: System Description**

- 6.1 The SYSTEM shall be a commercial modulating Auto Changeover single zone system. The controller will monitor duct temperature using air temperature sensor for operational mode, Heat/Vent/Cool operation for automatic system changeover.
- 6.2 Zone dampers shall be fully modulating dampers. The system shall measure duct temperature and zone temperature every 60 seconds to evaluate mode of operation and zone demand. System will modulate damper when heating or cooling set point calls and controller determines "Cool" air or "Heat" air is available to zone. If ventilation air is present, controller will modulate damper to 50% open and display VENT mode on display.
- 6.3 System controller shall digitally display room temperature and provide duct air temperatures at the SubZone.
- 6.4 The System shall provide control of AUX heating or REHEAT control.

### **PART 7: Control Manufacturer**

- 7.1 The control system will be the SubZone, as manufactured by Zonex Systems, Huntington Beach, CA. Any substitution of the above specified control system will require a 10-day prior approval by the engineer.
- 7.2 For pricing, contact the factory at 800-228-2966 or visit [www.zonexproducts.com](http://www.zonexproducts.com)
- 7.3 For substitution, submit a complete description, engineering data, and names of existing installations of substitute products.
- 7.4 Be prepared to provide a field inspection by the engineer, if he chooses to observe the actual installation of proposed substitution.

### **PART 8: Zone Temperature Sensors**

- 8.1 The typical Zone Temperature Sensor (SubZone) will contain all of the electronics to wirelessly communicate with communicating damper board, include push buttons on the face of control to set heating/cooling set point, and push buttons to allow the operator to change or review the SubZone set point.

- 8.2 The adjustable temperature range is from 55 to 95 degrees F. Celsius display shall also be available.
- 8.3 The SubZone shall have a large digital display showing current space temperature, duct temperature, the current mode of operation and the heating/cooling set point established for that zone.
- 8.4 The SubZone shall also be equipped with an off switch; when initiated, its zone damper will drive fully closed.
- 8.5 Each SubZone can control up to three slaved dampers.
- 8.6 The SubZone shall be available with Remote sensor capability.
- 8.7 The SubZone shall be configurable for baseboard and reheat operations.
- 8.8 The SubZone shall be used to configure communicating damper board for baseboard or reheat logic.
- 8.9 The SubZone shall communicate with communicating damper board to relay zone information for heat/cool demand.
- 8.10 SubZone shall include duct sensor with duct temperature display.
- 8.11 SubZone shall operate independently and shall not control the HVAC equipment.
- 8.12 SubZone shall have energy savings mode option to extend battery life.
- 8.13 SubZone shall have the ability for field calibration.

## **PART 9: Zone Dampers**

- 9.1 Each round zone damper (Model WST) shall consist of 20-22 gauge galvanized metal duct fitted with an elliptical damper to provide linear airflow. The damper shall contain a foam seal to prevent leakage when fully closed. Each damper will contain a full stall 24-volt modulating actuator, which shall not draw more than 2 VA on one drive assembly. The damper shell will be crimped on one end and beaded on both ends for damper rigidity. Dampers shall be equipped with min/max position stops and indicators.
- 9.2 Each rectangular zone damper (Model WCD) shall be constructed of a 20-gauge “snap-lock” steel frame with S & Drive connections. The total length of the damper will be 16”. Dampers 10” and smaller in height will utilize single blade construction; those dampers larger than 10” in height will utilize opposed blade construction. The damper blades are of formed steel design with gasketed stops to provide quiet operation and structural integrity. Dampers shall be equipped with min/max position stops and indicators.
- 9.3 Zone dampers shall be fully modulating in operation based on input received from each zone thermostat. Modulation shall be predicated on variance from set point. If the system has satisfied all calls, all dampers shall modulate to the 50% position for ventilation.
- 9.4 All zone dampers shall be wireless communication based with synched zone thermostat. The zone thermostat shall continuously monitor room temperature and communicate with control damper board.
- 9.5 Zone damper communicating damper board will position damper based on variance from its set point to provide effective temperature control as required.
- 9.6 When utilizing perimeter electric or hot water baseboard heating for supplemental heating, the control damper board operates zone damper only for airflow and energizes the supplemental heat when the temperature drops two degrees below set point. At one degree below set point, SubZone signals control damper board for heating call.
- 9.7 SubZone shall have an adjustable supplemental heat cut in range from 2 – 4 degrees.
- 9.8 When utilizing reheat feature, the control damper board shall energize reheat and modulate damper 50% to provide space temperature heating.

**PART 10: Transformers and Wiring**

**10.1** An independent 24-volt transformer sized at 2 VA per zone damper.

**10.2** All power wiring of this system shall be 24-volt AC.

END OF SECTION 15950

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