

SECTION 17000

AUTOMATIC TEMPERATURE CONTROLS

PART 1 DESIGN DIRECTIVES

1.1 DESIGN CRITERIA

- A. Systems shall be Honeywell or Johnson only, with design and installation performed by factory employees or by sub-contractors working under the supervision of factory representatives. Bids from contractors purchasing equipment from wholesalers are not acceptable.
- B. All systems shall be Honeywell EBI or Johnson Metasys Extended Architecture. Connections to the main controllers shall be via an Ethernet system.
- C. Higher level controllers shall be powered through a minimum fifteen minute UPS. Consult with DC-FO&M during design to determine the controller level requiring UPS service.
- D. The consultant shall confer with DC-FO&M regarding the portions of the ATC system that will need to be on emergency power.
- E. Individual room controllers shall be DDC. The consultant shall confer with DC-FO&M to ascertain if the controllers are room sensors or limited range thermostats.
- F. The design intent of all ATC systems is to eliminate pneumatic systems. Electric actuators shall be used wherever possible. Where air compressors are required, the following shall be required:
 - 1. The air compressor shall serve only the ATC system.
 - 2. Shall be a duplex type.
 - 3. Shall be on emergency power.
 - 4. Shall have an adjustable low air pressure alarm.
 - 5. Tank size shall be calculated for 50% run time. Calculations shall be provided to the Commissioning Agent for system and installation verification.

G. *Actuators used on steam valves shall be rated for minimum 140°F ambient.*

G-H. The consultant shall include in the design documents a point schedule.

- 1. Point schedules shall include but not be limited to:
 - a. Air Handling Units:
 - 1.) Coil discharge air temperature(s).
 - 2.) AHU discharge air temperature.
 - 3.) Mixed air temperature.
 - 4.) Water temperature(s) supply & return.
 - 5.) Pressure differential across the filter bank(s).
 - 6.) Control valve(s) position.
 - b. All sump pumps, including elevator sump pumps.
 - c. Cooling coil condensate pumps.
 - d. Steam condensate pump sets.
 - e. Electronic fuel monitoring devices (serving buildings & emergency generators).

- ~~H.I.~~ The consultant shall include the sequence of operations in the specifications and not on the drawings.
- ~~H.J.~~ All new buildings and major building renovations having 1,000 points or more shall be equipped with a lap top computer and a dedicated, secure location within the building.
- ~~H.K.~~ Graphics shall be included for all projects.
 - 1. Devices shall have sufficient data to identify the area served, such as building, room name, room number, floor.
- ~~K.L.~~ Refer to DC Standards, 01000 General Requirements for requirements pertaining to VFD's and ATC panels.
- ~~L.M.~~ Air Handling Units:
 - 1. Each coil shall have an RTD temperature sensor located downstream of the coil in the approximate center. In larger air handlers where there are stacked coils, each coil shall have a sensor. The sensor shall report back to the front end and appear on the graphics.
- ~~M.N.~~ The consultant shall determine the number of electrical circuits required by the ATC contractor and provide the circuits to a termination box near the controller. The ATC contractor shall extend the power as required for the operation of the control system.
- ~~N.O.~~ Airflow monitors shall be specified and furnished in this section. The consultant shall confer with DC-FO&M to determine the appropriate flow measuring device and the accuracy required.
- ~~O.P.~~ The ATC system shall collect data for the following services at the rates indicated:

Service	Pulse unit
Condensate (steam)	Gallon
Chilled water	Ton hour
Electricity	Kilowatt hour
- ~~P.Q.~~ All fume hoods equipped with air flow alarms shall signal to the Heating Plant via the DDC system.
- ~~Q.R.~~ Emergency generator dampers shall be normally open (spring return) and be on the emergency power system.
- ~~R.S.~~ All ATC wiring systems shall be in conduit in accordance with DC Standards 16110, RACEWAYS.

PART 2 PRODUCTS

2.1 GENERAL

- A. All devices shall be mercury free.

2.2 SENSORS

- A. Pump & fan status shall be determined by solid core adjustable current switches. Current switches shall have LED indicators. Hysteresis shall be 5% of setpoint.
 - 1. RE Technologies #CS1150A-LED
- B. Line length sensitive temperature sensors shall be RTD type, minimum 1,000 ohm.
- C. Hydronic temperature sensors shall be well type.
- D. Relative humidity sensors shall be accurate to $\pm 3\%$ over 100% of the range. Acceptable manufacturers:
 - 1. Mamac
 - 2. Vaisala
- E. Carbon monoxide sensors shall be accurate to $\pm 0.5\%$. Minimum life span is three years.
- F. Carbon dioxide sensors shall have recalibration intervals greater than every five years. Accuracy shall be ± 30 PPM.

2.3 SAFETIES

- A. Non-averaging freezestats shall be installed on all air-handling units after the heating coil. Where the heating coils have integral face & bypass dampers (Wing coils) the freezestat shall be located after the cooling coil. One 25' long freezestat shall be limited to 50 square feet of coil face area.

2.4 WIRING

- A. Minimum sensor size shall be 18 gage twisted wire.

PART 3 EXECUTION

3.1 INSTALLATION

- A. All wiring and enclosures shall comply with DC Standards 16010 BASIC ELECTRICAL REQUIREMENTS, 16110 RACEWAYS, 16135 CABINETS, BOXES, AND FITTINGS, and 16920 CLASS TWO WIRING.
- B. Pneumatic tubing shall be in conduit with the last 6" exposed where the tubing connects to a moving device. A bushing must be installed at the end of the conduit to prevent chaffing.
- C. The ATC contractor shall be responsible for the conduit run for the Ethernet connections from the ATC controller to the BDF.

3.2 COORDINATION

- A. If the project is to be commissioned, the contractor is required to work with the commissioning agent and related sub-contractors as required to fulfill the requirements of section 18000. The costs associated with this requirement shall be included in the contractor's base bid; hourly allowances are not acceptable.

END OF SECTION 17000