

**Part 1        General**

**1.1         NOT USED**

**Part 2        Products**

**2.1         GENERAL**

- .1        The existing Building Management System is capable of integrating multiple building functions, including equipment supervision and control, alarm management, energy management, and trend data collection. New controls components must tie into the existing system seamlessly.
- .2        The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices.
- .3        Acceptable Suppliers: This specification is based upon a “Metasys” system by Johnson Controls Ltd.

**2.6         FIELD EQUIPMENT**

- .1        Temperature Sensors
  - .1        Temperature sensors shall be 1000 OHM nickel RTD type. Analog temperature sensors shall provide an output signal that varies continuously with the sensed temperature, within a specified range. Binary temperature sensors shall provide an output signal that is either on or off depending upon whether the sensed temperature is above or below the setpoint temperature. All sensors of a particular category shall be of the same type and manufacturer. Provide temperature sensors suitable for one or more of the following mounting methods: duct mount, pipe thermowell mount.
  - .2        Insertion Type - Suitable for insertion into air ducts at any angle, and shall have a minimum insertion of 6".
  - .3        Immersion Type - Suitable for immersion into fluids in tanks or pipes with separable well and heat transfer compound. Sensor wells shall be brass and compatible with the sensor.
  - .4        Averaging Type with Extended Element - Suitable for duct mounting to obtain average temperature by sampling along a capillary tube element.
  - .5        Outside Air Sensing Type - Shall have sun shades to minimize solar effects and shall be mounted to minimize building outside air film effects.
  - .6        Space Type – Standard non-secure areas - occupied/unoccupied override switches. Thermostats/ sensors for terminal boxes shall have lockable access to temperature setpoint adjustment. Portable operator terminal shall be able to connect to space thermostat/sensor. Replace existing multi-zone temperature sensors with new in renovated areas.

- .7 Space Type – Secure Areas – locate sensors as shown on drawings. Sensors shall be moisture resistant, general purpose RTD/thermistor sensing element suitable for mounting concealed on rear side of blank wall plate. Sensing element to be firmly adhered to back of blank plate. Enclosure shall be designed and manufactured for secure installation in poured concrete walls and shall consist of 10 ga steel backplate for cast-in-place concrete or core-filled block construction, one-piece blank 10 ga steel front plate finished in baked white enamel and fastened with secure screws in each corner.
  - .1 Acceptable material: Johnson Controls, Greystone.
- .2 Differential Pressure Switches
  - .1 All pressure sensing elements shall be corrosion resistant.
  - .2 Pressure sensing elements shall be diaphragm type as required by the application.
  - .3 Units shall have adjustable range and differential pressure settings.
  - .4 Pressure sensor switches shall be snap action type.
  - .5 Sensor assembly shall operate automatically and reset automatically when conditions return to normal.
  - .6 Protect complete sensor assembly against vibration at all critical movement pivots and slides.
  - .7 Sensors on all liquid lines shall have an isolation valve installed between each sensor and its pressure source
- .3 Electric Operators (Valve)
  - .1 Provide a 24 vac control operators which are 0-10 VDC input proportional and designed for water or steam service valve bodies. Operator shall be Synchronous motor driven with 50 lb force and force sensor safety stop. Enclosure shall be cast aluminum.
- .4 Electric Operators (Damper)
  - .1 Provide 24 vac damper actuators which are 0-10 vac input proportional and designed to operate position dampers. Operator shall be synchronous motor driven with up to 100 in.lb. force sensor safety stops and spring return as required. Enclosure shall be cast aluminum.
- .5 Static Pressure Transmitters
  - .1 The sensors shall be a variable capacitance type, utilizing a stainless steel diaphragm and insulated electrode for positioning of the diaphragm.
  - .2 The sensor shall produce a linear 4 to 20 mA or 0-5 VDC with accuracy's of 1% full scale in normal ambient temperature environments.

- .3 Pressure ranges 0 to 0.1 in w.g. through 0 to 25.0 in w.g.
- .4 The transmitter shall be temperature compensated to account for any thermal error over the entire temperature range of 40°F-100°F, 0-95% RH. Overpressurization 10 in w.g. up to ten times range.
- .5 The transmitter shall have zero span adjustment capability, but shall be factory calibrated.

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Install the digital panel and other associated hardware as shown on plans.
- .2 Verify location of thermostats and other exposed control sensors with drawings before installation. Locate thermostats at same elevation as light switches.
- .3 Install damper motors on outside of ducts. Do not locate in air stream, except for roof mounted equipment.
- .4 Wire "hand/off/auto" selector switches such that automatic operating controls and not safety controls and electrical over current protection shall be overridden when switch is in the "hand" position.
- .5 Unless specified otherwise, install all outdoor air sensors on the north exposure of the building.
- .6 Install all safety limits at the operator's level.

**END OF SECTION 23 30 01**