

DDC CONTROLS

DESIGN GUIDELINES

1. Summary

- a. For renovation projects in existing buildings, discuss with WUSM Project Manager regarding existing building automation system manufacturer. Discuss master plan of building BAS and the scope of work to be included on each renovation project.

2. Design

a. Pneumatic Tubing

- Routed in stainless steel where subject to UV degradation or high temperatures (ex. Boiler rooms, etc.)

b. Control Valves shall be 2-way.

- Existing 3-way valves shall be replaced with 2-way.
- Sized for each application to for the connected load with a reasonable safety factor. The safety factor should be discussed for each application during design.
- The chilled water control valves serving a building shall be designed to operate efficiently within 20%-80% of connected capacity.
- The valves shall not be oversized where the valve will not be able to control efficiently during low demand.
- Provide unions on each side of all control valves. Dielectric unions not allowable.
- Provide control valve detail on drawings to indicate manufacturers recommended inlet and outlet straight piping requirements.

c. Control Valves – Steam

- Provide pneumatic steam control valves.
- Electric actuators have failed due to excessive heat.

d. Hydronic Sensors

- DDC sensors in water piping shall have a calibration well installed next to the sensor location for calibrating adjacent sensor.

e. Control supply to return fans with an offset control of Hertz. Reset hertz offset based on building pressure.

f. Freezestats

- Shall have remote manual reset mounted in an accessible location coordinated with facilities.
- Freezestats shall be averaging type installed diagonally across coil.

g. System Pressure

- High pressure, manual reset for fans on AHUs shall be installed in an accessible location and no greater than 6 feet above finished floor.

- High and low pressure sensors to monitor equipment with VFD's, Pumps, EF's, AHU's, Supply Fans, Return Fans, etc.
 - h. Variable Frequency Drives
 - Energy Recovery Unit
 1. VFD's provided for the wheel shall be controlled by the building DDC system and not controlled by equipment's internal controls.
 2. This needs to be verified with Semco for details.
 - VFD's shall provide a Bacnet interface and have the following points mapped to a WUSM computer:
 1. Start/stop to be hardwired
 2. Status thru CT
 3. Speed command thru Bacnet interface
 4. Hertz feedback thru Bacnet interface
 5. Additional points as needed may be mapped back to BAS via BACnet card.
 - i. Air Flow Measuring Stations
 - If air flow measuring stations are installed in duct, include filtration upstream of measuring station.
 1. Air flow measuring stations installed for measurement of outside air shall include design for protection against debris disrupting readings and increasing maintenance.
 - Include access to measuring station for cleaning station inside duct.
 - j. Provide discharge air temperature sensor on VAV boxes, Air Valves or other terminal units with hot water reheat coils.
 - k. Bacnet, MSTP controllers are preferred so that a data line is not required at major equipment controllers.
3. Related Sections
- a. Air Filtration
 - b. Air Handling Units
 - c. Air Valves
 - d. Chillers
 - e. Commissioning
 - f. Cooling Towers
 - g. Fan Coil Units
 - h. Humidifiers
 - i. HVAC Fans - General
 - j. HVAC Fans - Laboratory

- k. HVAC Water Treatment
- l. Laboratory Fume Hoods
- m. Pumps
- n. Pumps - Hydronic
- o. Pumps - Steam Condensate Pumps
- p. Refrigerant Monitoring Systems
- q. Terminal Units
- r. Variable Frequency Drives

EQUIPMENT and PRODUCT REQUIREMENTS

1. Approved Manufacturers

- a. Johnson Controls Inc. (JCI) - Metasys BACnet
- b. Schneider Electric - Dynamic Controls, Inc.
 - Schneider Electric Product(in order of preference)
 - Schneider Electric - BACnet Andover Controls
 - Schneider Electric – BACnet Ecostructure
 - Schneider Electric - BACnet IA

2. Thermostats

- a. LCD readout of room temperature with override button.
- b. JCI model NS-BTF or equivalent if Johnson Controls system.
- c. Corridors, Bathrooms and other common spaces shall have temperature sensors only without local adjustment controls.

END OF SECTION

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