

□ A15.1 **Standard of Practice - Building Automation Control System**

OBJECTIVE OF STANDARD

- To acquaint designers and other interested parties with the University's provisions for building automation control systems (BACS) within individual buildings and for centralized (BACS) on the main campus.
- To insure consistent specifications for, and installation of, building automation control system hardware and software within campus buildings and campus-wide network interface between building systems.
- To extend the University's capabilities for remotely monitoring the environmental status of all campus buildings.

METHODS OF DELIVERY OF BUILDING CONTROLS SYSTEMS

- Contract with Johnson Controls (JCI) for the BACS separately from the general construction contract, utilizing the State Contract. This has the benefit of saving contractor's markup, while the General Contractor (G/C) is still responsible for integrating the contract (like any other Owner requested contract) into the project.
- Include the BACS contract into the general construction contract. This has the disadvantage of adding the G/C's markup, but with the benefit of "single source" responsibility for the project.
- Specifications should reflect that JCI is the sole provider of BACS.

BUILDING INFRASTRUCTURE

Assume that existing campus buildings have the NAE (JCI Metasys front end) and N2 buss and require no further infrastructure. Extensive building renovations may require upgrading the NAE, please consult with University Project Manager (PM) and JCI.

If the building is new, it will require provision of infrastructure for connection to the campus BACS. This includes, at minimum, a dedicated 120V, 20A branch circuit for the NAE, a double-gang box with single-gang plaster ring and a 1" conduit from the NAE to an NTS closet for the N2 buss.

EQUIPMENT

Provide H-O-A switches on all motor starters, even those that are controlled by the BACS.

EQUIPMENT CONTROL POINTS

This is a list of the control points, strategies, and equipment that the University will require, where applicable, on future building construction projects. The DESIGNER shall provide a point list and sequence of operation for all listed equipment. The DESIGNER shall review Johnson Controls shop drawings for compliance with the design intent.

Except where noted as local, these points will be on the BACS.

Chiller

- status
- chilled water temperature (EWT/LWT)
- condenser water temperature (EWT/LWT)
- current
- fault/alarm contact(s)

Refrigerant monitor

- alarm
- PPM (Metasys)
- PPM (local)

Surge Suppression

- phase module failure

Pumps (all)

- Status

Boiler (steam or hot water)

- alarm
- steam pressure
- status
- steam flow
- call for heat
- firing rate

Hot water systems (Reheat or domestic)

- supply water temp.
- return water temp.

Sump Level (Elevator and other) / Water Detection

- Alarm

Emergency Generator

- alarm
- generator status
- transfer switch status

Battery/Inverter Systems

- alarm
- status
- lamp out
- others as required for NFPA 101 compliance

Variable Speed Drive (VSD)

- status
- speed
- speed command
- safety circuit (smoke detector)
- current

Cold Room / Freezer Monitoring

- status/alarm
- temp

Air Handling Units

- | | |
|---|--|
| <input type="checkbox"/> RA CO2 | <input type="checkbox"/> RA temp |
| <input type="checkbox"/> RA damper (%) | <input type="checkbox"/> RA RH% |
| <input type="checkbox"/> OA damper (%) | <input type="checkbox"/> VSD (as above) |
| <input type="checkbox"/> filter status | <input type="checkbox"/> RH% |
| <input type="checkbox"/> MA temp. | <input type="checkbox"/> Humidifier status |
| <input type="checkbox"/> MA low limit | <input type="checkbox"/> Humidifier alarm |
| <input type="checkbox"/> PH temp | <input type="checkbox"/> Chilled water valve (%) |
| <input type="checkbox"/> CC (or cold deck) temp | <input type="checkbox"/> Steam valve (%) |
| <input type="checkbox"/> Hot deck temp | <input type="checkbox"/> Heating hot water valve (%) |
| <input type="checkbox"/> DA temp | <input type="checkbox"/> Discharge static pressure |
| <input type="checkbox"/> OA temp | <input type="checkbox"/> Occupied/Unoccupied |
| <input type="checkbox"/> OA RH % | <input type="checkbox"/> Enthalpy |

Utility Metering

- | | |
|--|---|
| <input type="checkbox"/> natural gas usage | <input type="checkbox"/> water usage |
| <input type="checkbox"/> steam usage | <input type="checkbox"/> electricity demand / usage |

CONTROL STRATEGIES

HVAC Terminal Boxes

- occupied / unoccupied control

Air Handling Units

- occupied / unoccupied control

Chemical Fume Hoods

- | | |
|--|---------------------------------|
| <input type="checkbox"/> sash position monitor | <input type="checkbox"/> status |
|--|---------------------------------|

Lawn Irrigation

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> master control | <input type="checkbox"/> flow monitor |
|---|---------------------------------------|

Street Lighting Master Photocell

- current monitor

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