HVAC CONTROLS / EQUIPMENT

The purpose of this information is to establish a standard for all HVAC controls, along with equipment items used on projects for The University of Alabama in Huntsville. This standard shall be the basis of design and construction practices for all projects performed on campus.

It is desired that all control systems tie into an existing central building control system. However, in order to prevent component failures from affecting too much of a building's operation at the same time, the subsystem controls must be capable of operating in a stand-alone mode so as not to require remote access or communication with another controller or front end to function.

The HVAC and equipment control strategies shall take advantage of current ASHRAE (American Society of Heating, Refrigeration Air Conditioning Engineers) energy conservation measures that are required by code and, additionally, those measures that are cost effective and applicable to the current project. Additionally, all buildings are desired to be LEED Certified (Silver level has been determined minimum) and energy efficiency, design elements and equipment selection shall be carefully evaluated for energy conservation, economy of operation and simple payback.

In addition to those conservation measures required by code, UAHuntsville requires the following:

1. Airside economizer on all recirculation air handlers 10,000 CFM or greater.
2. DDC control to allow shutting down/setting back air handlers (and associated exhaust air handlers) to an unoccupied space temperature. Initial setback temperature will be 85 degrees (cooling) and 55 degrees (heating). All space thermostats served by each air handler will be polled for current space temperature. All setback times and temperatures will be available for viewing and adjustment from the campus wide control system. A centrally accessible key lockable mark time override switch will be installed in areas that have special events that require air conditioning and heating past normal business hours.
3. Spaces with significantly different occupancy to be on separate HVAC systems or separate zones so that those areas can be shut down individually.
4. Ductwork design that minimizes static pressure loss.
5. Heat Recovery for air handling units with greater than a 50% outdoor air requirement (not including units with an airside economizer).
6. Demand controlled ventilation (CO2 based) in all gymnasiums and all areas of assembly, classroom, lecture, auditoriums, foyers, and atriums greater than 2000 square feet.

All controls for equipment shall be Johnson Controls, a proprietary product or manageable by Johnson Controls campus wide system.

TYPE 1 CONTROLS are associated with large energy using systems such as:

1. Chillers and other central plant equipment (200 Refrigeration Tons and up).
2. Boilers and associated heating plant equipment (50 Boiler horsepower and up).

3. Large air handling units, cooling and heating coils, fans, dampers, filters, and their associated equipment (10,000 Cubic feet per minute and up).
4. Large fans for ventilation systems (20,000 Cubic feet per minute and up).
5. Large pumps and associated equipment (1,000 Gallons per minute and up).
6. Large preheat, reheat, and sub-cooling systems (10,000 Cubic feet per minute and up).
7. Large air distribution and exhaust systems (20,000 Cubic feet per minute and up).
8. All energy using equipment in critical areas such as animal areas, special labs, etc. as directed by UAHuntsville Facilities Office and/or Campus Architect.

TYPE 2 CONTROLS are those mounted in or above the space and controlling terminal devices such as VAV (Variable Air Volume) boxes, terminal reheat boxes, fan coil units, small air handling units or other such devices.

Control drawings shall be provided for every control system during the design stages and shall be submitted with the design stages. These drawings shall show all major equipment and the control components associated with this equipment, including connections between sensors, controllers, all interlocks from external systems, and actuators on typical ISA (Instrument Society of America) standards number 5.3. The drawings shall also define the sequence of operation of the system.

Software and hardware required to operate, maintain and repair all parts and equipment related to the control system shall be turned over to Maintenance through the University's Campus Architect/Project Manager at the time the University takes over operation of the area. This information will include copies of the program, configuration files in a format for downloading directly into the systems, and a format that allows editing and reinstalling. Communication boxes, cables, coded keys, and any other hardware required to work with the system shall be provided.

The University will comply with software license for systems. Due to the number of systems installed at the University, and the rapid changes expected in software, the University desires all software to be University site licensed (all of the University), with basic verbal assistance when requested, so that software may be installed in remote locations within the University. It is also required that all software be backward compatible to existing systems of the same brand name.

Type 1 Controls must be installed with the capability of communicating over the University's fiber optic Ethernet LAN (Local Area Network) network, **using TCP/IP protocol only,** to the University's computers without going through the operator's station. The network interface card will be 100 Mb Ethernet compatible 10/100 switchable. Although some buildings are not tied into the fiber at this time, all buildings will be in the future. Whether or not fiber is available, the controls will be Ethernet compatible for access when fiber is available. Off campus access is also required through a call-up modem (this can be through the operator's station). Type 1 Controls shall be provided with translators, software and other equipment as required to allow these controls to be monitored, reset, histories read, and all other functions performed from the existing central computer(s).

Type 2 Controls shall also communicate as described above but may use type 1 control as a gateway.

Training and Orientation needs will vary greatly for different projects. Factory training for the University's Maintenance and Energy Management personnel is a necessity. The specific requirements should be discussed with the directors of UAHuntsville Campus Architect, Director of Facilities and Energy Manager or representatives from those departments. Complete factory training shall be provided for the operation, maintenance and repair for the total control system proposed, and there shall be an allowance, including living expenses and meals, for three UAHuntsville employees to attend the training sessions and orientation for the system proposed when training cannot be conducted on campus.