SECTION 25 14 00 – BAS Field Panels

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.
          2. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.
       2. SUMMARY
          1. Section includes:

Supervisory Controllers

FEC Series Controller

* + - * 1. Furnish and install DDC Control units and/or Smart Devices required to support specified building automation system functions.
        2. Refer to Section 25 00 00 - Building Automation System (BAS) General for general requirements.
      1. REFERENCE STANDARDS
         1. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
         2. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
         3. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within all references.

1. PRODUCTS
   * + 1. GENERAL
          1. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.
       2. manufacturers
          1. The BAS and digital control and communications components installed, as Work of this Contract shall be an integrated distributed processing system of the following manufacturer or communication protocol. No other products will be considered as substitutions.

Johnson Controls Metasys Technology: Provide control products and systems that completely integrate and operate from the existing Bacnet network currently in operation in this organization.

All access, programming, alarming, system configuration shall be utilized from the existing system software and database without any third party programs or gateways.

* + - 1. Stand-Alone Functionality
         1. General: These requirements clarify the requirement for stand-alone functionality relative to packaging I/O devices with a controller. Stand-alone functionality is specified with the controller and for each Application Category specified in this Section.
         2. Functional Boundary:

Provide controllers so that all points associated with and common to one unit or other complete system/equipment shall reside within a single control unit. The boundaries of a standalone system shall be as dictated in the Contract Documents.

Systems specified for the Application Category will dictate the boundary of the standalone control functionality. See related restrictions below.

* + - * 1. The following configurations are considered acceptable with reference to a controller’s standalone functionality:

Points packaged as integral to the controller such that the point configuration is listed as an essential piece of information for ordering the controller (having a unique ordering number).

I/O point expander boards, wired directly into the main controller board to expand the point capacity of the controller.

* + - * 1. The following configurations are considered unacceptable with reference to a controller’s standalone functionality:
      1. All controllers in a control panel shall control the same equipment.Supervisory Controller(s)
         1. General Requirements:

The Supervisory Controller(s) shall provide fully distributed control independent of the operational status of the OWSs and BJC BAS Server. All control strategies performed by the Supervisory Controller shall be both operator definable and modifiable through the Operator Interfaces.

Supervisory Controller shall perform overall system coordination, accept control programs, perform automated HVAC functions, control peripheral devices and perform all necessary mathematical and logical functions.

Each controller shall permit multi-user operation from multiple workstations. Each unit shall have its own internal RAM, non-volatile memory, microprocessor, battery backup, regulated power supply, power conditioning equipment (if applicable), ports for connection of operating interface devices, and control enclosure.

Supervisory Controllers shall be programmable from an operator workstation, portable operator terminal, or hand held operating device. Supervisory Controllers shall contain sufficient memory for all specified global control strategies, user defined reports and trending, communication programs, and central alarming.

Supervisory Controller shall be connected to the BJC BAS network.

All Supervisory Controllers shall be protected from any memory loss due to a loss of power by one or a combination of the following:

Volatile RAM shall have a battery backup using a lithium battery with a rated service life of fifty (50) hours, and a rated shelf life of at least five (5) years. Self-diagnostic routine shall report an alarm for a low battery condition.

EEPROM, EPROM, or NOVROM non-volatile memory.

In addition, Supervisory Controllers shall provide intelligent, standalone control of HVAC functions. Each Supervisory Controller shall be capable of standalone direct digital operation utilizing its own processor, non-volatile memory, input/output, wiring terminal strips, real-time clock/calendar and voltage transient and lightning protection devices. Refer to standalone functionality specified above.

All Controller point data, algorithms and application software shall be modifiable from the Operator Workstation.

Supervisory Controllers shall provide buffer for holding alarms and messages. Alarms and messages shall reside in a buffer within the controller and be delivered up to the BJC BAS Server via the LAN when the buffer is full or when scheduled.

Supervisory Controllers shall provide buffer for holding trends. Trends shall reside in a buffer within the controller and be delivered up to the Server via the LAN when the buffer is full or when scheduled.

Each Supervisory Controller shall include self-test diagnostics, which allow the Supervisory Controllers to automatically alarm any malfunctions, or alarm conditions that exceed desired parameters as determined by programming input.

Input-Output Processing:

Binary Outputs (BO):

. Each shall be configurable as normally open or normally closed.

Analog Inputs (AI):

Provide signal conditioning, and zero and span calibration for each input.

Binary Inputs (BO):

Monitor dry contact closures.

Accept pulsed inputs of at least one per second. Source voltage for sensing shall be supplied by the supervisory controller and shall be isolated from the main board.

Universal Inputs (UI-AI or BI): To serve as either AI or BI as specified above.

Analog Outputs (AO):

Provide zero and span calibration and circuit protection.

Where these are allowed, transducer/actuator shall be programmable for normally open, normally closed, or hold last position and shall allow adjustable timing.

Digital to pneumatic transducers are acceptable.

Multiplexed pneumatic outputs of a separate manufacturer are unacceptable

Multiplexed pneumatic outputs of a separate manufacturer are unacceptable.

A communication port for operator interface through a terminal shall be provided in each Supervisory Controllers. It shall be possible to perform all program and database back-up, system monitoring, control functions, and supervisory controller diagnostics through this port. Standalone supervisory controller panels shall allow temporary use of portable devices without interrupting the normal operation of permanently connected modems, printers, or workstations.

All analog output points shall have a selectable failure setpoint. The supervisory controller shall be capable of maintaining this failure setpoint in the event of a system malfunction, which causes loss of supervisory controller control, or loss of output signal, as long as power is available at the supervisory controller The failure setpoint shall be selectable on a per point basis.

NAE Power Loss:

Upon a loss of power to any NAE, the other units on the primary controlling network shall not in any way be affected.

Upon a loss of power to any NAE, the battery backup shall ensure that the energy management control software, the Direct Digital Control software, the database parameters, and all other programs and data stored in the RAM are retained for a minimum of fifty (50) hours. An alarm diagnostic message shall indicate that the NAE is under battery power.

Upon restoration of power within the specified battery backup period, the NAE shall resume full operation without operator intervention. The NAE shall automatically reset its clock such that proper operation of any time dependent function is possible without manual reset of the clock. All monitored functions shall be updated.

Should the duration of a loss of power exceed the specified battery back-up period or NAE panel memory be lost for any reason, the panel shall automatically report the condition (upon resumption of power) and be capable of receiving a download via the network, and connected computer. In addition, the Owner shall be able to upload the most current versions of all energy management control programs, Direct Digital Control programs, database parameters, and all other data and programs in the memory.

NAE Failure:

Building Controller LAN Data Transmission Failure: NAE shall continue to operate in stand-alone mode. NAE shall store loss of communication alarm along with the time of the event. All control functions shall continue with the global values programmable to either last value or a specified value.

NAEs shall be mounted in packaged equipment enclosures, or locking wall mounted in an enclosure, as specified elsewhere.

All NAE naming conventions shall adhere to the format as established by the Owner’s Standard Acronyms document.

* + - * 1. I/O Point Expansion Devices communicating to Supervisory Controllers via a sub LAN protocol:

Utilizing any point from a point expansion device communicating to Supervisory Controllers via a sub LAN protocol to support the Supervisory Controller’s Stand Alone Functionality requirement is not allowed.

Point expansion devices shall be mounted in packaged equipment enclosures, or locking wall mounted enclosure in a readily accessible location. Identify panel enclosure with the entire point address of point expansion device(s) on an engraved phenolic or micarta nameplate.

Each point expansion device shall be identified in the database with the location of where the device is physically installed to allow the owner to service these devices when needed. The owner shall approve the final method identifying the locations with the available software options.

* + - * 1. BACnet Building Controller Requirements:

The Supervisory Controller(s) shall support all BIBBs defined in the BACnet Building Controller (B-BC) device profile as defined in the BACnet standard.

Supervisory Controllers shall communicate over the BACnet Building Controller LAN.

Each Supervisory Controller shall be connected to the BACnet Building Controller LAN communicating to/from other Supervisory Controllers.

* + - 1. Field Equipment SERIES Controllers
         1. General Requirements:

The FEC series and IOM series controllers shall provide intelligent, standalone control of HVAC equipment. Each unit shall have its own internal RAM, non-volatile memory and will continue to operate all local control functions in the event of a loss of communications on the Supervisory Controller LAN.

FEC series controller shall include sufficient memory to perform the specific control functions required for its application and to communicate with other devices.

Each FEC series controller must be capable of stand-alone direct digital operation utilizing its own processor and non-volatile memory. All volatile memory shall have a battery backup with a battery life of five (5) years.

All point data; algorithms and application software within an FEC series controller shall be modifiable from the Operator Workstation.

FEC series controllers Input-Output Processing

Binary Outputs (BO): Outputs shall be rated for a minimum 24 VAC or VDC, 1 amp maximum current. Each shall be configurable as normally open or normally closed. Provide suppression to limit transients to acceptable levels.

Analog Inputs (AI): AI shall be O-5 Vdc, 0-10Vdc, 0-20Vdc, and 0-20 mA. Provide signal conditioning, and zero and span calibration for each input.

Binary Inputs (BI): Monitor dry contact closures. Accept pulsed inputs.

Universal Inputs (AI or BI): To serve as either AI or BI as specified above.

c Analog Outputs (AO) as required by application:

Provide zero and span calibration and circuit protection.

Transducer/actuator shall be programmable for normally open, normally closed, or hold last position and shall allow adjustable timing.

* + - * 1. BACnet FEC series controller Requirements:

The FEC series controller shall support all BIBBs defined in the BACnet Supervisory Controller (NAE Series) device profile as defined in the BACnet standard.

Each FEC series controller shall be connected to the BACnet Supervisory Controller LAN communicating to/from other Supervisory Controllers.

1. EXECUTION
   * + 1. PREPARATION
          1. Examine areas and conditions under which control systems are to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
       2. INSTALLATION
          1. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
          2. All installation shall be in accordance with manufacturer’s published recommendations.
          3. All Division 25 installation including but not limited to, cable and wiring, grounding, raceway and conduit, electrical circuit and panel identifications, wiring devices, and lighting shall comply with Division 26 installation requirements. In addition to the Division 26 requirements, contractor shall label panel board name and circuit number in an owner approved manner at each BAS field panel, control cabinet, or point of termination in which a 120VAC control circuit is utilized.
       3. System Access
          1. . The location that has been designated for the local supervisory Lan device shall have a network access point wired directly to the supervisory controller. **BJC Guest wireless signal is required in this area.**
       4. HARDWARE APPLICATION REQUIREMENTS
          1. General:

The functional intent of this specification is to allow cost effective application of manufacturers standard products while maintain the integrity and reliability of the control functions.

* + - * 1. Standalone Capability:

Each Control Unit shall be capable of performing the required sequence of operation for the associated equipment.

* + - * 1. Where associated control functions involve functions from different categories identified below, the requirements for the most restrictive category shall be met.

Where points are trended, Contractor shall verify and document that the network bandwidth is acceptable for such trends and is still capable of acceptable and timely control function.

* + - 1. CONTROL UNIT REQUIREMENTS
         1. Refer to Section 25 00 00 for requirements pertaining to control unit quantity and location.

END OF SECTION 25 14 00