SECTION 25 0553

Identification for BAS electrical systems

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LANL MASTER SPECIFICATION

This template must be edited for each project. In doing so, Specifier must add job-specific requirements. Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.  Once the choice is made or text supplied, remove the brackets.  The specifications must also be edited to delete specification requirements for processes, items, or designs that are not included in the project -- and specifier’s notes such as these.

To seek a variance from requirements in the specifications that are applicable, contact the Engineering Standards Manual Chapter 8[POC](http://engstandards.lanl.gov/POCs.shtml#ic). Please contact POC with suggestions for improvement as well.  
  
When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General requirements.  
  
Specification developed for ML-4 projects.  For ML-1, 2, and 3 applications, additional requirements and independent reviews should be added if increased confidence in procurement or execution is desired; see ESM Chapter 1 Section Z10 Specifications and Quality sections.

NOTE 1: This specification overrides Division 26 electrical installation requirements for BAS systems only. If the designer wishes to use Division 26 installation requirements for specific portions of the BAS design, then these must be clearly noted on the drawings as a deviation from this specification requirement.

NOTE 2: If particular naming conventions or color codes have been previously defined for a specific facility, they may be used in place of those specified in this section. Edit this specification to be compatible with the specific facility requirements.

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1. GENERAL
   1. Section Includes
      1. Component identification tags.
      2. Enclosure nameplates.
      3. Equipment nameplates.
      4. Wire markers.
      5. Cable markers
      6. Voltage markers.
   2. LANL PERFORMED WORK
      1. None
   3. SUBMITTALS
      1. None required, unless alternate, engineer-approved alternative is used.
   4. REGULATORY REQUIREMENTS
      1. Conform to requirements of the National Electrical Code (NEC), NFPA 70E, and OSHA.
   5. Coordination
      1. Coordinate identification names, abbreviations, colors, and other features with requirements in the Subcontract Documents, Shop Drawings, and manufacturer's wiring diagrams, with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
      2. Verify electrical and mechanical equipment designations with LANL through the Subcontract Technical Representative (STR) if they are not specifically designated on design documents. Do not arbitrarily assign designations.
   6. Applicability
      1. Identification used for low voltage (<100VDC and < 50VAC) building automation systems (BAS).
2. PRODUCTS
   1. PRODUCT OPTIONS AND SUBSTITUTIONS
      1. Alternate products may be accepted; follow Section 01 2500, Substitution Procedures.
   2. Component Identification TAGS
      1. Furnish component identification tags as specified below to identify BAS System equipment using the tag names specified in the drawings. When no specific tag name is provided in the drawings for a particular component, no tag is required.
      2. Provide component identification tags with black letters on white background with a minimum tag height of 1/2” and a minimum text height of 3/8”. Provide tags made of one of the following materials:
         1. Type 1 (Indoor Applications Only):
            1. Laminated plastic adhesive tape with machine printed letters.
            2. Manufacturer: Brother, Seton, Brady.
         2. Type 2:
            1. Two-ply plastic nameplate with letters engraved through white surface showing black core.
            2. Provide UV stabilized material for outdoor applications.
            3. Manufacturer: Seton Nameplate Corp., Kele.
   3. ENCLOSURE NAMEPLATES(1)
3. Furnish enclosure nameplates as specified below to Identify BAS control cabinets and enclosures that are 12 inches x 12 inches or larger with the following information:
   * + 1. As a minimum the text “BAS CONTROLS” shall be indicated
       2. If a specific designation for the cabinet or enclosure is provided on the drawings it shall be included on the second line of the nameplate or on a second nameplate directly below the first nameplate.
4. Provide enclosure nameplates with black letters on white background with a minimum tag height of 1” and a minimum text height of 3/4”. Provide tags made of the following materials:
   * + 1. Laminated plastic adhesive tape with machine printed letters.
       2. Manufacturer: Brother, Seton, Brady.
   1. EQUIPMENT NAMEPLATES
      1. Furnish equipment nameplates as specified below to indicate the following information on BAS power supplies fed by 120VAC or higher:
         1. Category I nameplates:
            1. Served by nameplates: circuit directory information including circuit number, equipment identification, location of equipment serving the item, and the circuit voltage (e.g. 120V).
      2. Coordinate equipment nameplate schedule with equipment numbering scheme provided by LANL STR.
      3. Provide nameplates made of one of the following materials:
         1. Type 1 (Indoor Applications Only):
            1. Laminated plastic adhesive tape with machine printed letters.
            2. Manufacturer: Brother, Seton, Brady.
         2. Type 2:
            1. Two-ply plates with letters engraved through surface color showing core color.
            2. Use UV stabilized material for outdoor applications.
            3. Manufacturer: Seton Nameplate Corp., Kele.
      4. Provide 10 point minimum size lettering.
      5. Provide colors as follows:
         1. Category I nameplates: white or black letters on blue background.
      6. Dimensions shall be as follows:
         1. Category I nameplates: 1 inch by 2 1/2 inch minimum
      7. Location:
         1. Name plates may be placed directly adjacent to equipment being marked if insufficient room is available on the equipment.
         2. If no room is available on or adjacent to the equipment being marked the tag size may be modified to fit available space or tag may be placed on a brass tag or made of engraved plastic and permanently hung from the equipment with a ball type chain.
         3. Do not apply nameplate over information provided by the manufacture of the equipment.
   2. WIRE MARKERS
      1. Where individual wires (not cables) are used in BAS systems they shall be provided with a wire marker.  
           
         Example: THHN or MTW single conductor wire that is not part of a cable assembly. Wires that exit a cable assembly shall fall under 2.6, E. for labeling requirements.
      2. Furnish heat-shrinkable sleeve, or self-laminating adhesive wire markers.
         1. Heat shrink sleeves shall be shrunk to tightly fit the wire.
      3. Locate a wire marker on each conductor at BAS devices, BAS control panels, junction boxes where spices in the conductor are made, and each load or sensor connection.
      4. Provide typewritten lettering on wire markers as follows:
         1. Control circuits: Control wire number indicated on schematic or interconnection diagrams or equipment manufacturer's wiring diagrams
         2. Where a specific wire name is not indicated on drawings use the following default text:  
              
            24VAC Ungrounded: “24VAC HOT”  
            24VAC Grounded: “24VAC COM”  
            Freeze Stat Signals: “FREEZE”  
            Fire Alarm Signals: “BAS FIRE”  
            DC Power Sources: The voltage level followed by “DCV +” or DCV –“  
              
            Were multiple power sources of the same type and voltage exist in a single system identify the unique source by adding a unique letter enclosed in parenthesis after the main identifier for each source. For example “24VAC HOT (A)” or “15VDC – (C)”
      5. Wires that are part of a multi-conductor cable do not have to individual wires identified (See 2.6 Cable Markers below)
      6. Wires that are completely contained in a BAS control cabinet do not need to be labeled unless specifically noted in the drawings.
      7. Manufacturer: LEM Products, Inc., Brady, Panduit.
   3. Cable MARKERS
      1. Where multi-conductor cables are used in BAS systems they shall be provided with a cable marker.  
           
         Exception: When cables are part of a pig tail permanently attached to a field device, no label is required.
      2. Furnish heat-shrinkable sleeve, or self-laminating adhesive cable markers.
         1. Heat shrink sleeves shall be shrunk to tightly fit the outside sheath of the cable.
      3. Locate a cable marker on each cable at any location where the outer cable jacket is removed
      4. Provide typewritten lettering on cable markers as follows:
         1. Control circuits: Control cable number indicated on schematic or interconnection diagrams or equipment manufacturer's wiring diagrams
         2. Where a specific cable name is not indicated on drawings use the following default text:  
              
            24VAC Power: “24VAC”  
            Signal Cable: The identification of the connected field device, i.e. “TE-101”  
            Combo power and signal: ”The identification of the connected field device, i.e. “TE-101” plus “24VAC”
      5. Individual wires within a color coded multi-conductor cable do not need to be labeled unless specifically called for in the drawings. The drawings should indicate the color to be used or be as-built to indicate the colors used (See Section 25 0519 for default colors).
      6. Manufacturer: LEM Products, Inc., Brady, Panduit.
   4. VOLTAGE MARKERS
      1. Furnish voltage markers for BAS control panels and enclosed BAS transformers
      2. Provide flexible pressure sensitive vinyl markers with minimum 1 inch x 4 inches orange background and black letters.
         1. The marker may be made smaller if insufficient space is available on the equipment being marked.
         2. Engraved plastic markers may be used in place of pressure sensitive vinyl markers and shall be orange background and white letters
      3. Provide voltage markers with lettering indicating the highest voltage present:
         1. Up to 24V AC or DC: 24 VOLTS
         2. 120 Volt System: 120 VOLTS
      4. BAS cabinets that have internal, fully enclosed power supplies, where no exposed voltage exceeds 24V shall be externally labeled as 24 VOLT on the exterior of the cabinet. The internal power supply enclosure shall be labeled with its maximum internal voltage on the exterior of the power supply.
   5. Working Space Labels
      1. Provide labels indicating required working clearance at BAS control panels
      2. Material:
         1. Use polyester label stock that is NRTL-recognized to UL969, *Marking and Labeling Systems*, and has a high adhesion adhesive back.
         2. Use printing ribbon recommended by the label stock manufacturer.
         3. Use a suitable thermal transfer process label-printing machine to generate labels and enter the application-specific information
         4. Outdoor labels shall be suitable for a high-UV environment.
      3. Minimum dimensions: 3-1/2 x 1-1/4 inches.
      4. Use the following label design:

|  |
| --- |
| *NOTICE* |
| Keep area in front of this electrical equipment clear for #-#/# feet.  OSHA-NEC regulations. |

* + - 1. Signal word: “NOTICE” in 24-point-minimum, white italic letters on safety blue panel.
      2. Word message: 16 point minimum black or safety blue letters on white background.
         1. Word message for 24-volt and 120-volt equipment: “Keep area in front of this electrical equipment clear for 3 feet. OSHA-NEC regulations.”

1. EXECUTION
2. EXAMINATION
3. Examine surfaces to receive identification products for compliance with installation tolerances and other conditions affecting performance of the identification products. Do not proceed with installation until unsatisfactory conditions have been corrected.
4. INSTALLATION - General
5. Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
6. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
   * + 1. Coordinate installation of identifying devices with location of access panels and doors.
       2. Install identifying devices before installing acoustical ceilings and similar concealment.
7. Install electrical identification products only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.
8. Clean surface where electrical identification product is to be placed.
9. Use manufacturer's recommended adhesive for engraved tags and nameplates. When engraved tags and nameplates are installed in exterior locations also provide a minimum of two 4-40 or larger screws to secure the tag or name plate.
10. Place electrical identification products centered and parallel to equipment lines.
11. Install tags, nameplates, markers and labels when provided under PART 2 of this Section.

END OF SECTION

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Do not delete the following reference information.

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FOR LANL USE ONLY

This project specification is based on LANL Master Specification 25 0553 Rev. 0, dated December 6, 2016.