

SECTION 26 28 13

~~~ PROJECT NOTE ~~~~~

ARCHITECT OF RECORD/ENGINEER OF RECORD IS RESPONSIBLE FOR REVIEWING THIS SPECIFICATION SECTION IN DETAIL FOR COORDINATION WITH THE PROJECT SCOPE OF WORK.

ALL "PROJECT NOTE" TEXT IS TO BE REMOVED FOLLOWING REVIEW OF THE CONTENT OF EACH NOTE BY THE ARCHITECT OF RECORD/ENGINEER OF RECORD.

EDIT THE DOCUMENT FOOTER TO INCLUDE THE PROJECT NAME AND NUMBER.

EDIT THE DOCUMENT HEADER TO INDICATE THE ARCHITECT OF RECORD PROJECT ISSUE" DATE. THE "CPS CONTROL" DATE SHOULD NOT BE EDITED.

ANY MODIFICATIONS TO THE TECHNICAL STANDARDS IN THIS SECTION - INCLUDING THE REMOVAL OR ADDITION OF MANUFACTURERS - MUST BE APPROVED BY CPS.

REQUESTS FOR MODIFICATION ARE TO BE SUBMITTED TO THE DESIGN MANAGER DURING THE DESIGN PHASE FOR REVIEW AND APPROVAL.

~~~ END OF PROJECT NOTE ~~~~~

FUSES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Fuses.
- B. Spare fuse cabinet.

1.02 REFERENCE STANDARDS

- A. NEMA FU 1 - Low Voltage Cartridge Fuses; 2012.
- B. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

1.04

~~~ PROJECT NOTE ~~~~~

SELECT EQUIPMENT WITHIN PROJECT SCOPE THAT UTILIZE FUSES.

~~~ END OF PROJECT NOTE ~~~~~

- A. Coordination:
 - 1. Coordinate fuse clips furnished in equipment provided under other sections for compatibility with indicated fuses.
 - a. Fusible Switches for Switchboards: See Section 26 24 13 - Switchboards.
 - b. Fusible Switches for Panelboards: See Section 26 24 16 - Panelboards.
 - c. Fusible Enclosed Switches: See Section 26 28 16.16 - Enclosed Switches.

- d. Fusible Switches for Enclosed Motor Controllers: See Section 26 29 13 - Enclosed Controllers.
2. Coordinate fuse requirements according to manufacturer's recommendations and nameplate data for actual equipment to be installed.
3. Notify Architect/Engineer of Record of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- 4.

~~~ PROJECT NOTE ~~~~~

**VERIFY USE OF FUSES WITH ELEVATOR FEEDERS AND ELEVATOR DISCONNECT SWITCHES WITHIN THE PROJECT SCOPE.**

~~~ END OF PROJECT NOTE ~~~~~

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.
 1. Spare Fuse Cabinet: Include dimensions.
 2. Fuse size for elevator feeders and elevator disconnect switches.
- C. Maintenance Materials: Furnish the following for Board's use in maintenance of project.
 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 2. Extra Fuses: Quantity equal to twenty percent of each fuse type and size, but no fewer than one (1) set of three (3) of each type and size.
 3. Fuse Pullers: One (1) set(s) compatible with each type and size installed.
 4. Spare Fuse Cabinet Keys: Two (2).
 5. Operation and Maintenance Manual:
 - a. In addition to items specified in Sections 01 77 00 - Closeout Procedures and 01 78 00 - Closeout Submittals, include the following:
 - 1) Let-through current curves for fuses with current-limiting characteristics.
 - 2) Time-current curves, coordination charts and tables, and related data.
 - 3) Ambient temperature adjustment information.

1.06 QUALITY ASSURANCE

- A. Comply with the City of Chicago Electrical Code.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Bussmann, a division of Eaton Corporation: www.cooperindustries.com.
- B. Littelfuse, Inc: www.littelfuse.com.
- C. Ferraz Shawmut, Inc.: www.ferrazfuses.com.

2.02 APPLICATIONS

- A. Service Entrance:
 - 1. Fusible Switches up to 600 Amperes: Class RK1, fast-acting, non-time-delay.
 - 2. Fusible Switches Larger Than 600 Amperes: Class L, fast-acting, non-time-delay.
- B. Feeders:
 - 1. Fusible Switches up to 600 Amperes: Class RK1, time-delay.
 - 2. Fusible Switches Larger Than 600 Amperes: Class L, time-delay.
- C. General Purpose Branch Circuits: Class RK1, time-delay.
- D. Individual Motor Branch Circuits: Class RK1, time-delay.
- E. In-Line Protection for Pole-Mounted Luminaires: Class CC, time-delay.
- F. Primary Protection for Control Transformers: Class CC, time-delay.

2.03 FUSES

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.
- C. Provide fuses of the same type, rating, and manufacturer within the same switch.
- D. Comply with UL 248-1.
- E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.
- F. Voltage Rating: Suitable for circuit voltage.
- G. All fuses shall be of the same manufacture to insure retention of selective coordination as designed.
- H.

~~~ PROJECT NOTE ~~~~~

**SELECT FUSE TYPES FOR PROJECT. COORDINATE WITH EXISTING CONDITIONS FOR EXISTING GENERAL-PURPOSE SWITCHES.**

~~~ END OF PROJECT NOTE ~~~~~

- I. General: Apply current limiting fuses as indicated and as follows:
 - 1. New general purpose fusible switches: Apply for the following class types:
 - a. 0-600 Amperes: Class RK1, dual element time delay; LPN-RK, LPS-RK.
 - b. 601-1,200 Amperes, Motor or Transformer Circuit: Class L, time delay; Lo-Peak KRPC.
 - 2. Bolted Pressure Switches: Class L, time delay.
 - 3. Switches in Switchboards: Apply the following classes and types:
 - a. 60-600 Amperes: Class RK1, dual element time delay; LPN-RK, LPS-RK.
 - b. 601 Amperes and Above: Class L, time delay; Lo-Peak KRPC.
 - 4. Existing General-Purpose Switches:
 - a. 30-600 Amperes: Class RK1, dual element time delay; LPN-RK, LPS-RK.

- b. 601-1,200 Amperes: Class L, time delay; Lo-Peak KRPC.
- J. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.
- K. Provide the following accessories where indicated or where required to complete installation:
 - 1. Fuse holders: Compatible with indicated fuses.
 - 2. Fuse Reducers: For adapting indicated fuses to permit installation in switch designed for fuses with larger ampere ratings.
 - 3. Fuse pullers.
 - 4. Fuse pull rings.
 - 5. Handling poles with extensions.
 - 6. Pole grapplers, prongs, clamps, etc.
- L. Provide fuseholders to accommodate the fuses specified. Coordinate installation with assembly manufacturers as applicable. Provide pins or other physical rejection features when current limiting fuses are specified, and non-current limiting fuses of the same dimensions are available.
- M. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.
- N. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size.
- O.

~~~ PROJECT NOTE ~~~~~  
**SPARE FUSES FOR PROJECT WILL BE COORDINATED WITH BOARD. CONFIRM EXISTING SPARE FUSE CABINET(S) IN EXISTING BUILDINGS TO BE RENOVATED.**

~~~ END OF PROJECT NOTE ~~~~~

2.04 SPARE FUSE CABINET

- A. Description: Wall-mounted sheet metal cabinet with shelves and hinged door with key-coded cam lock and pull, suitably sized to store spare fuses and fuse pullers specified with 15 percent spare capacity minimum.
- B. Finish: Gray, baked enamel unless otherwise indicated.
- C. Identification: "SPARE FUSES" in 1-1/2 inch high letters on exterior of cabinet door.
- D. Fuse Puller: For each size of fuse.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that fuse ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.
- B. Verify that mounting surfaces are ready to receive spare fuse cabinet.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Fuses shall not be installed in the equipment until the installation is complete, tested and ready to be energized. Paralleling of fuses will not be permitted.
- G. All fuses shall be sized as indicated on the Contract Drawings. Where fuse ratings are not indicated for fuses used to provide motor backup protection or as short circuit protection, such fuses shall be sized in accordance with the heavy service recommendations of the fuse manufacturer.
- H.

~~~ **PROJECT NOTE** ~~~~~  
**SELECT ALL APPLICATIONS WITHIN THE PROJECT SCOPE.**

~~~ **END OF PROJECT NOTE** ~~~~~

3.02 FUSE APPLICATIONS

- A. Service Entrance: Class L, fast acting.
- B. Feeders: Class L, time delay.
- C. Motor Branch Circuits: Class RK1, time delay.
- D. Other Branch Circuits: Class RK1, time delay.

3.03 INSTALLATION

- A. Do not install fuses until circuits are ready to be energized.
- B. Install fuses with label oriented such that manufacturer, type, and size are easily read.
- C. Install spare fuse cabinet where indicated.
- D. Identify spare fuse cabinet in accordance with Section 26 05 53 - Identification for Electrical Systems.
- E. Fuses shall not be installed in the equipment until the installation is complete, tested and ready. All low voltage fuses are sized based on the results of short circuit and coordination study as specified in Section 26 05 73 - Power System Studies.
- F. The Contractor shall affix to the inside of the door of each fuse enclosure a label or sticker indicating the proper type and rating of fuse. The fuse manufacturer's labels shall be used.
- G. Install typewritten labels indicating fuse replacement information on inside door of each fused switch.

3.04 DEMONSTRATION AND TRAINING

- A. Training: Arrange and pay for the services of factory-authorized service representatives to demonstrate OCPD's and train Board's maintenance personnel.
- B. Conduct a minimum of one half (1/2) day of training in operation and maintenance as specified in the Sections 01 77 00 - Closeout Procedures and 01 79 00 - Demonstration and Training.

Include both classroom training and hands on equipment operation and maintenance procedures.

- C. Schedule training with at least seven (7) days' advance notice.

END OF SECTION 26 28 13