SECTION 26 28 13
FUSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufacturers
2. Cartridge Fuses

B. Meet the following performance requirements:

1. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (5 deg C or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.
2. Seismic Performance: In accordance with Section 26 00 10.

C. System Description

1. Fuses to be provided for all equipment furnished on installed under this section as indicated on the Drawings. Provide fuse type and rating as indicated here in or on the Drawings, or as recommended by the manufacturer or required by codes or standards.

1.2 RELATED WORK

A. Section 26 00 10 – Basic electrical requirements, is an integral part of this section. Requirements and work indicated in 26 00 10 are not repeated in this Section.

1.3 COORDINATION

A. Coordinate work under provisions indicated in Section 26 00 10.

1.4 QUALIFICATIONS / QUALITY ASSURANCE

A. Conform to requirements indicated in Section 26 00 10.

1.5 REGULATORY REQUIREMENTS AND REQUIREMENTS

A. Conform to requirements indicated in Section 26 00 10 in addition to following:

1. Furnish products listed and classified by NRTL acceptable to authority having jurisdiction as suitable for purpose specified and indicated.
2. Codes and Standards in addition to Section 26 00 10 requirements:
   a. NEMA FU 1 - Low Voltage Cartridge Fuses.
   b. UL 489 - Series Ratings.
   c. ANSI C97.1 - Low Voltage Cartridge Fuses (600 volts or less).
   d. UL 198 - Fuses.

1.6 SUBMITTALS

A. Submit as required here in and under Section 26 00 10.

B. Submit manufacturer's technical product data on fuses, including specifications, electrical characteristics, installation instructions, furnished specialties and accessories. In addition, include voltages and current ratings, interrupting ratings, current limitation ratings, time-current trip characteristic curves, and mounting requirements.

C. Vellum (original) copies of operating curves shall be submitted for each type of fuse furnished. Photocopies are not acceptable. Electronic copies compatible with SKM software are acceptable.

D. Manufacturer's name, class voltage rating shall be submitted for each type fuse furnished.

E. Series ratings for fuses and circuit breakers shall be submitted.

1.7 EXTRA MATERIALS

A. Furnish under provisions indicated in Section 26 00 10.

B. Provide the following additional materials:

1. 600 Ampere and Smaller: 10 percent of each rating (minimum of 3 per rating).
2. 601 Ampere and Larger: 3 of each rating.
3. Fuse Pullers: Provide 2 of each type required.

C. Locate extra materials in spare fuse cabinets. Provide number of spare fuse cabinets as required for quantity of extra materials.

1.8 PROJECT RECORD DOCUMENTS

A. Submit under provisions indicated in Section 26 00 10.

B. Record on final Drawings actual fuse sizes and types installed, adjacent to each device.

1.9 OPERATION AND MAINTENANCE DATA

A. Submit under provisions indicated in Section 26 00 10.

1.10 WARRANTY

A. Provide under provisions indicated in Section 26 00 10.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Bussmann, Inc.
2. Ferraz Shawmut, Inc.
3. S&C
4. Littlefuse, Inc.
5. Edison Fuse, Inc.
6. Substitutions: Under provisions of Section 26 00 10.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

B. All power fuses rated 600 volts and less shall be rejection type.

C. Class L Time-Delay Fuses: Provide NRTL Class L time-delay fuses rated 600 volts, 60 hertz, with 200,000 RMS symmetrical interrupting current rating.

D. Class RK1 or RK5 Time-Delay Fuses: Provide NRTL Class RK1 time-delay fuses rated 600 volts, 60 hertz, with 200,000 RMS symmetrical interrupting current rating.USES

2.3 SPARE-FUSE CABINET

A. Characteristics: Wall-mounted steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.

1. Size: Provide heavy duty, steel or aluminum, 24 inch (600 mm) wide by 30 inch (750 mm) high by 12 (300 mm) inch deep minimum, key lock handle, baked gray enamel, hinged door and 2 keys per cabinet. Adequate for storage of spare fuses specified with **15** percent spare capacity minimum.
2. Finish: Gray, baked enamel.
3. Identification: "SPARE FUSES" in 1-1/2-inch- (38-mm-) high letters on exterior of door.
4. Fuse Pullers: For each size of fuse, where applicable and available, from fuse manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

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.

3.2 FUSE APPLICATIONS

A. Cartridge Fuses:

1. Provide Class RK5 time-delay fuses for the following types of loads (circuits with heavy in-rush currents):
   a. Motors and motor controllers.
   b. Transformers (600 volts or less).
2. Provide Class RK1 current-limiting (fast acting) fuses for the following types of loads (circuits with no heavy in-rush currents):
   a. Lighting.
   b. Non-motor loads.
   c. Feeder circuits.
   d. Panelboards.
   e. Circuit breaker protection.
3. Provide Class L time-delay fuses for the following types of loads (601 amperes or higher):
   a. Motors.
   b. Transformers.
   c. Circuit breakers.
   d. Service Entrance

4. Provide class CC fuses for the following types of loads.
   a. Control circuits.

3.3 INSTALLATION

A. Provide one complete set of fuses for all fusible equipment furnished, installed or wired under Division 26.

B. Fuses shall be of the correct rating for each installation and shall be of the classes and respective performance herein specified.

C. Install fuses in accordance with manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. Comply with standards for installation of fuses.

D. All necessary information required to permit the proper selection of fuses shall be obtained from the Architect if not indicated in the Contract Drawings, Specification, or manufacturer's shop drawings.

E. Replace, at no additional cost to the Owner, all fuses lost, damaged or destroyed during the progress of the Project. At the completion of the project, all fusible equipment shall be correctly fused and operational.

F. All fuses shall have a minimum interrupting rating of 120 percent of the maximum available system short circuit current but in no case shall they be rated less than 100,000 amperes RMS symmetrical.

G. Two or more fuses applied in series shall, whenever possible, be selected with the proper time-current and let-through energy characteristics to provide selective circuit protection for fault and overload conditions.

H. All fuses shall be high interrupting capacity type, NRTL listed and labeled, Class: L, RK1, or RK5.

I. Fuses shall be fast acting, low peak dual element, time delay type unless specifically indicated otherwise.

J. The continuous current-carrying capacity of all fuses shall not vary in total more than 10 percent from the labeled ampere rating when operated in ambient temperatures ranging from 25 degrees C to 50 degrees C. All fuses shall be certified for compliance with this equipment.

K. Provide spare fuse cabinets (in Main Electrical Room) or as indicated on Drawings or by Owner to house spare fuses required under this section.

L. Install fuse with label oriented such that manufacturer, type, and size are easily read.

M. Install spare-fuse cabinet(s).

3.4 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

3.5 FIELD QUALITY CONTROL

A. Prior to energization of fusible devices, test devices for continuity of circuitry and for short circuits. Replace malfunctioning units with new units and then demonstrate compliance with requirements.

END OF SECTION