Preparing Activity: NASA Superseding
UFGS-33 77 36.00 40 (May 2017)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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MEDIUM-VOLTAGE UTILITY FUSES

08/23

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SECTION 33 77 36.00 40

MEDIUM-VOLTAGE UTILITY FUSES
08/23

NOTE: This guide specification covers the requirements for distribution fuse cutouts. Show on drawings current rating, load-break fuses if required, combination lightning arresters and fuse cutouts if required, and mounting details.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically

place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 242	(2001; Errata 2003) Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems - Buff Book
IEEE 399	(1997) Brown Book IEEE Recommended Practice for Power Systems Analysis
IEEE C2	(2023) National Electrical Safety Code
IEEE C37.40	(2003; Errata 2003; R 2009) Service Conditions & Definitions for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, & Accessories
IEEE C37.41	(2016; Corr 2017) Design Tests for High-Voltage (>1000 V) Fuses and Accessories
IEEE C37.42	(2016) Specifications for High-Voltage (> 1000 V) Fuses and Accessories
IEEE C37.46	(2010) Standard for High Voltage Expulsion and Current-Limiting Type Power Class Fuses and Fuse Disconnecting Switches
IEEE C37.47	(2011) Standard for High Voltage Distribution Class Current-Limiting Type Fuses and Fuse Disconnecting Switches

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 3	(2005; R 2010) Medium-Voltage Controllers Rated 2001 to 7200 V AC
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023) National Electrical Code

1.2 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; G[, [____]]

Installation Drawings; G[, [____]]

SD-03 Product Data

Distribution Fuse Cutouts; G[, [____]]

SD-07 Certificates

Testing Certificates

SD-08 Manufacturer's Instructions

Fuse Cutouts

Manufacturer's Installation Instructions

1.3 QUIALITY CONTROL

1.3.1 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Provide equipment, materials, installation, and workmanship in accordance with the mandatory and advisory provisions of NFPA 70, IEEE C2 unless more stringent requirements are specified or indicated.

1.3.2 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Provide products that have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period includes applications of equipment and materials under similar circumstances and of similar size. Provide products that have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, use items of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

1.3.2.1 Material and Equipment Manufacturing Date

Do not use products manufactured more than 3 years prior to date of delivery to site, unless specified otherwise.1.3.3 Shop Drawings

Submit connection diagrams showing the relations and connections of control devices and protective devices by showing the general physical layout of all controls, the interconnection of one system (or portion of system) with another, and internal tubing, wiring, and other devices.

Submit fabrication drawings for control devices and protective devices consisting of fabrication and assembly details to be performed in the factory.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

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NOTE: Show the following information the drawings:

1. Conductor sizes, types, and materials.

2. Primary fused cutout; give voltage rating and state fusing (ampere rating) and "K" quick or "T" tardy required for coordination with existing upstream sectionalizing equipment.

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Submit fabrication drawings for fuse cutouts consisting of fabrication and assembly details to be performed in the factory.

Submit equipment and performance data for distribution fuse cutouts including life, testing certificates verifying conformance to referenced standards, system functional flows, safety features, and mechanical automated details.

2.2 EQUIPMENT

2.2.1 Standards

Distribution fuse cutouts are required to meet the following standards:

a. IEEE C37.40

b. IEEE C37.41

c. IEEE C37.42

d. IEEE C37.46

e. IEEE C37.47

f. IEEE 242

g. IEEE 399

h. NEMA ICS 3

i. NEMA ICS 6

k. NFPA 70

2.2.2 Fuse Cutouts

Submit manufacturer's instructions for fuse cutouts, including special provisions required to install equipment components and system packages. Include special notices detailing impedances, hazards, and safety precautions.

Provide distribution fuse cutouts that are self-contained, enclosed, dropout type, or open type when required for higher voltage or interrupting rating. Install loadbreak cutouts only if specifically indicated.

Provide fuse cutouts that have an interrupting capacity sufficient to break the maximum system fault current to which the cutout will be subjected. The minimum interrupting capacity is 16,000 amperes (A) root mean square (rms) asymmetric.

Provide heavy-duty or extra-heavy-duty classification cutouts. Cutouts installed on three-phase, 13.2 kilovolt (kV) or 13.8 kV systems must be

rated at 15 kV. The installation of cutouts rated at 7.8 kV on these systems is not allowed.

Provide fuse links with a continuous rating equal to approximately 150 percent of the full-load line current when used for transformer protection, and approximately [100][110][_____] percent of the conductor-rated capacity when used for circuit protection. Provide 15kV cutuouts that have a wet withstand, 10-second voltage rating of 37 kV, with a 95 kV basic impulse level (BIL). Provide a continuous current rating of 100 A unless otherwise indicated. Provide fuse disconnects rated not less than 100 amperes, having attachments to permit manual operation of the disconnect under load without external arcing.

Where indicated, combine lightning arresters and fuse cutouts.

PART 3 EXECUTION

3.1 INSTALLATION

Install distribution fuse cutouts in accordance with installation drawings and with the manufacturer's installation instructions.

-- End of Section --