



Document Title:

**Open Type Fused Cutout, 27 kV, Polymer**

Document Type:

**Specification**

Engineering Type

**Equipment Specificati**

Document No.:

**4350.011**

Department

**Distribution**

Version:

**08**

Effective Date:

**Dec 17, 2024**

**Shared document with: N/A**

*\*Select the Departments impacted by the document*

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**Related/Referenced Documents**

N/A

**Version History**

Version	Date	Revision Comments
01	Oct. 11, 2021	From PREPA to LUMA format for Items 010-76584, 010-76585, 010-76572, and 01076574.
02	Feb. 22, 2022	Wildlife protection discarded
03	Abr. 12, 2022	Sections 3, 4, and 7 edited. TOC added.
04	Oct. 14, 2022	Cover Page added, Section 9.6.a edited, and TOC edited.
05	Jan. 25, 2023	Cover Page added and Section 9.4.b. modified.
06	Feb. 06, 2023	Sections 9.4.c, 9.4.h, Table 1 (ABB models), and TOC modified
07	Aug. 31, 2023	General format and title modifications. Items 010-76572 and 010-76574 removed (DNR).
08	Dec. 17, 2024	General format modifications, TOC updated, Sections 3, 4, 8 & 9 modified, and sections order rearranged. Note from version 01 (10-11-21) modified (past note said Initial Release).



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Polymer  
Document No.: 4350.011  
Department: Distribution

## Item Version History

Warehouse Catalog #	Asset Suite #	Version	Date
010-76584	76584	8	12/17/2024
010-76585	76585	8	12/17/2024



## 1. Introduction

This is a general specification that covers the minimum requirements for open-type fused (drop-out) cutouts used in the distribution system in Puerto Rico. Further information will be provided by LUMA Energy at the time of order placement and will provide information on site specific conditions, quantity, and other requirements. This document includes the general electrical and mechanical characteristics of the equipment/material.

## 2. Special Requirements

Samples shall be furnished as requested by LUMA Energy. Vendors that have supplied this equipment/material to LUMA on previous orders will not have to furnish samples at bid opening. The equipment/material will be received at LUMA's general warehouse (O11) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.

## 3. Literature

- 3.1. Descriptive and technical literature must be supplied by the vendor at time of bidding. This literature must include, but is not limited to details of material, drawings, documented testing, and instructions for use and installation. **The literature must be an official document from and certified by the manufacturer.** Failure to submit documents on time and duly certified by the manufacturer will cause bidder disqualification.
- 3.2. If required by LUMA, final drawings and documentation shall be submitted by the vendor before the manufacturing and shipping process for approval.

## 4. Compatible with

For compatible manufacturer and model see Table 1. These models are examples of the equipment/material described in this document and do not represent a preference. LUMA will evaluate equally any model not listed here during any acquisition event.

## 5. Markings

- 5.1. Containers or pallets shall be marked outside with LUMA Energy's purchase order and warehouse catalog number.

5.2. Individual package(s) shall be clearly marked with manufacturer name and item information (part number, serial number, quantity, etc.).

5.3. Packaging labels and tags shall be waterproof.

## **6. Packaging**

6.1. All equipment/material shall be packaged and marked in such a way as to facilitate handling and protection from damage and that the receiving warehouse can readily identify it and send it, in one complete unit, to a field location without opening crates or boxes to sort items and/or parts.

6.2. A warning label shall be placed on the equipment/material for special handling and storage requirements.

6.3. All equipment/material, elements, parts, and hardware crates shall be shipped on flatbed trailers and stored in such a way so that they can be unloaded by finger lifts. Deliveries in containers or closed platforms where finger lifts cannot be used will not be accepted.

## **7. Number Per Package (Logistics)**

Standard package: One (1) unit per box or as requested by LUMA.

## **8. Acceptance Criteria**

8.1. Test required: certified by external laboratories.

8.2. Product shall be manufactured in accordance with the latest issue below (section 8.3). When conflicts occur between purchaser's specifications and the latest issue below, the purchaser's specification shall prevail.

8.3. Latest applicable codes, standards, and other regulations:

- a. ANSI/IEEE (C37.41, C37.42): Standard design tests for high-voltage (>1000 V) fuses and accessories.
- b. IEC/TS 60815-3: Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - part 3: Polymer insulators for A.C. systems.
- c. ANSI/ASTM A153: Standard specification for zinc coating (hot dip) on iron and steel hardware.
- d. ANSI Z535: Sign standards for utility installations specification.
- e. IEC 60529 IP65: Certification for degree of intrusion protection against foreign bodies (tools, dirt, etc.) and moisture by mechanical casings and electrical enclosures.
- f. IEEE 1656-2010: Guide for testing the electrical, mechanical, and durability performance of wildlife protective devices on overhead power distribution systems rated up to 38 kV.

- 8.4. Cutouts must be designed such that they pass all testing requirements of IEEE Standard C37.41, including, but not limited to:
- a. Dielectric tests.
  - b. Mechanical tests.
  - c. Environmental tests (includes accelerated UV exposure test).
  - d. Water penetration and void tests.
  - e. Interrupting tests and temperatures extremes tests
- 8.5. If any other standards different from the ones indicated in this document are used, the supplier must provide information showing compatibility with the required ones.

## 9. Description

- 9.1. Used for overcurrent protection on overhead electric distribution systems.
- 9.2. Cutouts shall be capable of operating at the rated voltage of all LUMA Energy's distribution systems, transformer connections, and customer loads, including single-phase or three-phase, grounded, non-effectively, or delta. Project information will be provided by LUMA Energy at time of order placement and will provide information on site specific conditions, quantity, type of cutout, and electrical requirements.
- 9.3. Electrical Requirements:
- a. Shall operate on both three-phase and single-phase to 4.16 kV through 15 kV.
  - b. Design Voltage: 27.0 kV.
  - c. Nominal Operating Voltage: 14.4 kV.
  - d. Minimum Leakage Distance: 17" (43.18 cm).
  - e. 60 Hz withstand voltage:
    - 1. Dry, one minute: 50 kV.
    - 2. Wet, ten seconds: 45 kV.
  - f. For current ratings and basic insulation level (kVBIL), see Table 1.
  - g. All electrical ratings shall comply with ANSI/IEEE C37.42.
  - h. All cutouts shall be designed to preclude any corrosion which might occur because of current flowing between dissimilar metals. Galvanized steel parts or bolts in continuous current paths shall not be allowed.
  - i. All cutouts shall accept universal button head fuse link sizes from 3 amperes to the rated continuous current of the cutout.

#### 9.4. Physical Requirements:

- a. The cutout shall be manufactured with a polymer insulator made of a 3/4" (1.9 cm) minimum fiberglass rod. Sheds shall have alternated or offset design.
- b. Both connection terminals shall have a parallel groove connector which can accept a conductor, size #6 AWG solid through 2/0 AWG stranded.
  1. The connector material shall be compatible with either copper or aluminum conductors.
  2. The connectors are to be coated with an approved oxide inhibiting compound.
  3. The connector bolt is to be suitably staked to the cutout and shall be carriage type. Each bolt must include a nut, a flat washer, and a lock washer. All hardware on stainless steel 304 or 316.
  4. The preferred location for the lower connection terminal is on the back side of the lower contact assembly, positioned so that the electrical connection will extend downward on a plane approximately with the cutout insulator.
- c. The current-carrying contacts shall be silver-plated or constructed of equivalent low resistance, or corrosion resistant material, subject to the approval of LUMA Energy's material specification engineer.
  1. The fuse top connection contact shall be grooved, and silver plated with raised points of contact. Shall have a stainless steel spring to maintain contact pressure, with a stabilizer pin in the middle to prevent the spring from getting out of place in an operation. The hood shall be solidly enough to avoid bending or deformation.
  2. The lower contact pressure is to be accomplished by spring loading.
  3. Pick-up of the lower spring contact is to be accomplished before closing of the top fuse holder contacts.
  4. All contact surfaces between the stationary main body of the cutout and the operating fuse tube holder shall be coated with an electrical contact aid to prevent corrosion and to aid in maintaining low joint resistance.
- d. All non-current carrying parts shall be 304 or 316 series stainless steel.
- e. A stop shall be provided to prevent the overswing of the fuse holder beyond a 180-degree arc after the operation of the cutout. This stop shall be in either the lower contact assembly or in the fuse holder.
- f. All surfaces that come in contact with the fuse link tail, such as the bottom of the fuse holder and the flipper or link ejector, shall have a sufficiently smooth and rounded surface, with no rough edges to eliminate stress of the flexible cable.

- g. The fuse tube shall be constructed of moisture proof and arc resistant material such as a high-strength fiberglass with an ultraviolet inhibitor coating. The length shall be 14-3/4" (37.46 cm) approximate to match the existing codified replacement ones (010-08093: S&C 89532R10, Hubbell T710313T; 010-01171: S&C 89572R11, Hubbell T710343T).

#### 9.5. Mechanical Requirements:

- a. All cutouts shall be equipped with an ejector device or flipper arm which will, under all faulty conditions, mechanically disengage the fuse tube from the upper cutout contacts. The device and the associated activating spring shall be made of stainless steel (304 or 316), or similar corrosive resistant metal, and be shaped to position and hold the tail of the fuse link in place.
- b. The fuse tube shall include a mechanical assist spring to aid dropout operation in corrosive environments. The spring shall be made of stainless steel 304 or 316.
- c. The tensile force on the fuse link shall not exceed 10 lbs. (4.5 kg). If the fuse tube is not rigidly connected to the bottom set of live parts, a suitable latching device must be present to relieve any force on the fuse link when the cutout is being closed. To afford a secure grip on the tail of the fuse link, either the tightening nut or mating surface must be knurled.

#### 9.6. Environmental Requirements:

- a. Temperature & Humidity: Equipment supplied shall be adequate for an operating temperature range of 0°C to 50°C (32 to 122°F), with humidity up to 100%.
- b. Pollution: The equipment shall be designed and constructed for the corrosive environment of a distribution system in a tropical zone close to sea or exposed to strong sea winds and it shall provide reliable performance in environments with high exposure to salt, minerals, chemicals, or wind-borne particulate. The insulator contamination levels for the equipment should be adequate to prevent flashover.
- c. UV Protection: The equipment shall be constructed of UV-resistant material, and it shall have passed the accelerated UV-exposure test.

### 10. Inspection

The acceptance of any equipment/material shall in no way relieve the vendor from his responsibility to meet all the requirements of this specification, and it would not prevent subsequent rejection if such equipment/material were found later to be defective.

### 11. Warranty

- 11.1. Replacement costs associated with cutouts or parts failure due to inadequate design, faulty manufacturing, or packaging are to be the responsibility of the supplier.



- 11.2. Non-conformance observed during sampling will require the supplier to bring the cutouts into compliance with the specification 14 days after receiving them from the purchaser. The units shall be shipped to the supplier at the supplier's expense.
- 11.3. In reply to the purchaser's request for quotation, supplier shall include the terms and conditions of the warranty period and coverage.
- 11.4. The supplier shall warrant the product against failure while operating under normal conditions.

## 12. Proposal Information

- 12.1. Submitted proposals must include:
  - a. Technical information, drawings, and tests.
  - b. Table of Compliance completed by the bidder with reference (see Appendix 1).

### 13. Table 1: Warehouse and Asset Suite Identification Number

Warehouse Catalog #	Asset Suite #	Amps Rating	kVBIL	Interrupting Amps Rating (Asymmetrical)	Compatible Manufacturer & Model 1	Compatible Manufacturer & Model 2
010-76584	76584	100	150	12,000	Hubbell (CP710313PZMS)	ABB (AJ25CCNN13K)
010-76585	76585	200	150	12,000	Hubbell (CP710343PZMS)	ABB (AJ25CCNN23K)

— End of Specification —



## Appendix

## Appendix 1: Table of Compliance

Line	Description	Pass/Fail (P/F)	Comments
1	Complies with the specification document 4350.011.		
2	Industry Standards: IEEE (C37.41, C37.42, 1656), IEC/TS 60815-3, IEC 60529 IP65.		
3	Tech. info., drawings, and tests provided.		
4	27 kV Class		
5	150 kVBIL		
6	Current		
	010-76584: 100A		
	010-76585: 200A		
7	Interrupting Current (Asymmetric): 12 kA		
8	60Hz Withstand V (Dry, 1 min.): 50 kV		
9	60Hz Withstand V (Wet, 10 sec.): 45 kV		
10	Min. Leakage Distance: 17"		
11	Current Carrying Parts: Silver Plated		
12	Non-Current Carrying Parts: SS 304 or 316		
13	Hardware: SS 304 or 316		
14	Rod: 3/4" min. diameter		
15	Polymer Insulation		
16	Fuse Tube		
	Length: 14-3/4" approx.		
	High Strength Fiberglass with UV protection.		
17	Coastal environments type cutout (stainless steel parts).		
18	Solid hood that doesn't bend and a pin, coming through the spring, for support between the hood and the top contact.		
19	Parallel groove connectors for CU/AL conductors (2 to 2/0 AWG).		
20	Stop mechanism to prevent the fuse holder from overswing beyond 180°.		
21	Spring assistance in the fuse tube for corrosive environments operation.		

**NOTE: This table is only a checklist for reference. The compliance must be with the complete document. Filling out the table with "PASS" won't be accepted as a compliance without the technical information required to certify it.**











# 4350.011 Fused Cutout 27kV (12-17-24)

Final Audit Report

2024-12-17

Created:	2024-12-17
By:	Miguel Rios (miguel.rioslopez@lumapr.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA12ICjukvaGPfL91spABZzHGe6WpEa-10

## "4350.011 Fused Cutout 27kV (12-17-24)" History

-  Document created by Miguel Rios (miguel.rioslopez@lumapr.com)  
2024-12-17 - 2:19:50 PM GMT
-  Document emailed to Miguel Rios (miguel.rioslopez@lumapr.com) for signature  
2024-12-17 - 2:19:55 PM GMT
-  Document e-signed by Miguel Rios (miguel.rioslopez@lumapr.com)  
Signature Date: 2024-12-17 - 2:20:37 PM GMT - Time Source: server
-  Document emailed to Rodolfo Flores (rodolfo.floresortiz@lumapr.com) for signature  
2024-12-17 - 2:20:39 PM GMT
-  Email viewed by Rodolfo Flores (rodolfo.floresortiz@lumapr.com)  
2024-12-17 - 5:29:28 PM GMT
-  Document e-signed by Rodolfo Flores (rodolfo.floresortiz@lumapr.com)  
Signature Date: 2024-12-17 - 5:31:39 PM GMT - Time Source: server
-  Document emailed to Ricardo Castro (ricardo.castro@lumapr.com) for signature  
2024-12-17 - 5:31:41 PM GMT
-  Email viewed by Ricardo Castro (ricardo.castro@lumapr.com)  
2024-12-17 - 5:41:05 PM GMT
-  Document e-signed by Ricardo Castro (ricardo.castro@lumapr.com)  
Signature Date: 2024-12-17 - 5:41:19 PM GMT - Time Source: server
-  Agreement completed.  
2024-12-17 - 5:41:19 PM GMT