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Heavy-Duty (Riser Pole) Distribution Class Surge Arrester

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1. Introduction

This is a general specification that covers the minimum requirements for the heavy-duty (riser pole) distribution class surge arrester 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 material to PREPA / LUMA on previous orders, will not have to furnish samples at bid opening. The equipment/material will be received at the LUMA's general warehouse (011) at Palo Seco, Puerto Rico. Shipping will include transportation and unloading at the indicated warehouse.

3. Literature

Descriptive and technical literature must be supplied by vendor at time of bidding. This literature may include, but is not limited to details of material, drawings, documented testing, and instructions for use and installation. Failure to submit documents on time will cause bidder disqualification. For products described in this specification as requiring qualification, awards will be made only for such products that, prior to the time for opening of bids, had been tested and/or approved by LUMA. Evidence of LUMA Energy's approval of the equipment or material shall be supplied by vendor if requested by LUMA Energy.

4. Markings

- 4.1. Containers shall be marked outside with LUMA Energy's purchase order and item number.
- 4.2. Packaging labels and tags shall be waterproof.

5. Compatible with:

For compatible manufacturers and models see Table 3. These models are examples of the material(s) described in this document and does not represent a preference. LUMA will evaluate equally any model not listed here during any acquisition event.



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6. Packaging

All material and equipment 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.

7. Number Per Package (Logistics)

- 7.1. Standard package: One (1) unit per carton box or as requested by LUMA Energy.
- 7.2. Each arrester is shipped with terminal hardware assemble in an individual high strength cardboard carton box. Any optional bracket or hardware are provided unassembled.

8. Acceptance Criteria

- 8.1. Test required: certified by external laboratories.
- 8.2. Latest applicable codes, standards, and other regulations:
 - a. IEEE C62.11 or IEC 60099-4: Standard for Metal-Oxide Surge Arresters for AC Power Circuits (>1 kV).
 - b. ANSI/NEMA
 - c. ASTM

9. Description

- 9.1. Heavy-duty (Riser Pole), outdoor distribution-class 10 kA, metal-oxide varistor (MOV), single piece silicone rubber housing arrester for 4.16KV, 7.32/8.34KV, 13.2KV, 60 hz, effectively grounded systems.
- 9.2. All exposed metal parts of the arrester must be stainless-steel 304/316 or bronze.
- 9.3. The arrester must include an insulated hanger.
- 9.4. Minimum leakage distance for the arrester and the insulated hanger as per Table 1 (sections 9.15.a.). The arrester shall have a minimum of two sheds.
- 9.5. Overall height must not exceed 12 in (30.48 cm).
- 9.6. The arrester must have a solderless clamp type terminal for line leads connection.
- 9.7. The line terminal must be a 3/8 in (9.53 mm) stainless-steel stud with a wire clamp, lock washer, and nut. All of them in stainless-steel or bronze.



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- 9.8. Clamp type connectors must be capable of securely clamp aluminum or copper stranded conductors of sizes #6 to #2 AWG.
- 9.9. The ground terminal must include a stainless-steel or bronze wire clamp and nut.
- 9.10. Ground terminals must include isolator with a 3/8 in (9.53 mm) stainless-steel stud.
- 9.11. The arrester must be free of radio influence voltage which may cause communication interference.
- 9.12. Must be designed to withstand forces developed by 160 mph winds (30 psf).
- 9.13. Arrester must show positive isolation and visual indication from the ground if it fails.
- 9.14. The following minimum information must be permanently attached to or stamped as part of the arrester:
 - a. Device Name
 - b. Manufacturer's name, trademark, type, and identification number
 - c. Manufacture date
 - d. Rating
- 9.15. It must have approximately the following characteristics:
 - a. Table 1: Rating and Insulation

System Voltage	Arrester Rating		Minimum Creepage Distance	Insulated Hanger Minimum Leakage Distance
	MOV	MCOV		
4.16kV	3kV	2.55kV	7.2 in (18.29 cm)	5.9 in (14.97 cm)
7.2/8.32kV	6kV	5.1kV	10.1 in (25.65 cm)	5.9 in (14.97 cm)
13.2kV	10kV	8.4kV	13 in (33.02 cm)	5.9 in (14.97 cm)
Arrester Insulation Withstand Voltages				
Arrester Rating		1.2/50µs Impulse (kV Crest)	1 min. Dry (kV rms)	10 sec. Wet (kV rms)
MOV	MCOV			
3kV	2.55kV	78	47	24
6kV	5.1kV	91	56	36
10kV	8.4kV	104	64	45



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b. Table 2: Protective Characteristics

System Voltage	Arrester Rating		0.5 μ s Discharge Voltage (KV)	Max Switching Surge Protective Level (KV Crest)			
	MOV	MCOV					
4.16kV	3kV	2.55kV	15	10.4			
7.2/8.32kV	6kV	5.1kV	20	14			
13.2kV	10kV	8.4kV	37	24			
Max Discharge Voltages Using 10 kA, 8X20 μ s Current Wave (kV Crest)							
Arrester Rating		1,500A	3,000A	5,000A	10,000A	20,000A	40,000A
MOV	MCOV						
3kV	2.55kV	7.8	8.1	8.4	9.1	10.1	11.6
6kV	5.1kV	15.6	16.3	17.0	18.3	20.2	23.4
10kV	8.4kV	23.1	24.1	25.1	27.0	29.8	34.6

10. Inspection

The acceptance of any material or equipment 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 materials were found later to be defective.

11. Proposal Information

11.1. Submitted proposals must include:

- a. Technical information
- b. Table of Compliance completed by the bidder with reference. (See Appendix 1)

12. Table 3: Warehouse and Asset Suite Identification Number

Warehouse Catalog #	Asset Suite #	System Voltage	Arrester Rating		Compatible Manufacturer	Compatible Model
			MOV	MCOV		
004-00028	48193	4.16kV	3kV	2.55kV	CPS UltraSIL polymer housed VarisSTAR	URS0303-0B1A-1A1A
					Hubbell PVR Optima	221603-7214
					TE Connectivity	DOV-03A-M0D0B0-I
004-00044	48195	7.2/8.32kV	6kV	5.1kV	CPS UltraSIL polymer housed VarisSTAR	URS0604-0B1A-1A1A
					Hubbell PVR Optima	221605-7214
					TE Connectivity	DOV-06A-M0D0B0-I
004-00143	53994	13.2kV	10kV	8.4kV	CPS UltraSIL polymer housed VarisSTAR	URS1005-0B1A-1A1A
					Hubbell PVR Optima	221609-7214
					TE Connectivity	DOV-10A-M0D0B0-I

— End of Specification —



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Appendix



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Appendix: Table of Compliance for Heavy-Duty (Riser Pole) Distribution Class Surge Arresters

Line	Criteria	Description	Pass/Fail (P/F)	Comments
1	Specification	The Proponent complies with the corresponding specification document 4350.010.		
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ANSI, NEMA, ASTM, IEEE)		
3	Type	Outdoor distribution-class 10 kA, metal-oxide varistor (MOV)		
4	Material	<ul style="list-style-type: none"> • Arrester: Silicone Rubber Housing • Studs and Hardware: Stainless-Steel 304/316 or Bronze. • Crossarm Bracket: Hot Dip Galvanized 		
5	Arrester Ratings	<ul style="list-style-type: none"> • 004-00028: 4.16kV, MOV 3kV, MCOV 2.55kV • 004-00044: 7.2/8.32kV, MOV 6kV, MCOV 5.1kV • 004-00143: 13.2kV, MOV 10kV, MCOV 8.4kV 		
6	Product Requirement	Overall height must not exceed 12".		
7	Product Requirement	Insulated hanger and a crossarm mounting bracket (NEMA type).		
8	Product Requirement	Solderless clamp type terminal for aluminum or copper stranded conductors of sizes #6 to #2 AWG in the line side.		
9	Product Requirement	3/8" stud with wire clamp, lock washer, and nut for the line terminal.		
10	Product Requirement	Ground terminals include isolator with a 3/8" stud.		
11	Product Requirement	The ground terminal must include a stainless-steel or bronze wire clamp and nut.		
12	Product Requirement	The arrester has permanently attached or stamped the required minimum information shown on section 9.15.		
13	Product Requirement	Insulation characteristics as per Table 1 (Section 9.15.a.).		
14	Product Requirement	Protective characteristics as per Table 2 (Section 9.15.b.).		











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Final Audit Report

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