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**Line Post Sensor**

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**Author**

Rodolfo A Flores Ortiz, PE  
General Engineer, Distribution Standards & Materials

Signature and Date

Sep 26, 2023

**Reviewer**

Rafael Torres Martínez, PE  
Supervisor, Distribution Standards & Materials

Signature and Date

Sep 26, 2023

**Approver**

Ricardo Castro Gómez, PE  
Manager, Distribution Standards & Materials

Signature and Date

Sep 26, 2023

**Management Approval (If apply)**

**Approver**

Name  
Position

Signature and Date

N/A

**Related/Referenced Documents**

N/A.

**Version History**

Version	Date	Revision
01	09/26/2023	Initial release



## Item Version History

Warehouse Catalog #	Asset Suite	Version	Date
014-84525	84525	1	09/26/2023
014-85358	85358	1	09/26/2023



## 1. Introduction

This is a general specification that covers the minimum requirements for the line post sensor 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 material.

## 2. Special Requirements

Samples shall be furnished as requested by LUMA Energy. Vendors that have supplied this material to 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 the 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 PREPA's and/or LUMA Energy's approval of the equipment/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

See Table 1 for specific models. 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.

## 6. Packaging

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.

## 7. Number Per Package (Logistics)

One (1) kit per package or as requested by LUMA Energy.

## 8. Acceptance Criteria

- 8.1. Test required: certified by external laboratories.
- 8.2. Latest applicable codes, standards, and other regulations.

## 9. Description

### 9.1. Overhead Line Post Sensor

a. Line post sensor for accurately measuring current and voltage in feeders to be used in smart grid applications.

b. Electrical Requirements:

- |   |                                     |
|---|-------------------------------------|
| 1. Voltage Class:                                   | 15 kV or 27 kV                      |
| 2. Frequency:                                       | 60 Hz                               |
| 3. Basic Insulator Level:                           | 110 kV                              |
| 4. Leakage Distance, minimum:                       | 19.9 in (50.5 cm)                   |
| 5. Dry arc distance, minimum:                       | 8.8 in (22.3 cm)                    |
| 6. Partial discharge test voltages:                 | 11 kV                               |
| 7. Current output:                                  | 600 A:10 V                          |
| 8. Voltage Divider Ratio:                           | 1400:1                              |
| 9. Voltage signal output accuracy and Phase shift:  | $\pm 1\%$ , $0^\circ \pm 1^\circ$   |
| 10. Current signal output accuracy and Phase shift: | $\pm 1\%$ , $0^\circ \pm 1.5^\circ$ |

c. Construction:

- |   |                                |
|---|--------------------------------|
| 1. Material: hydrophobic cycloaliphatic epoxy |                                |
| 2. Approximate height to conductor:           | 9.4 in (23.88 cm)              |
| 3. Operating temperature range:               | -45°C to +55°C                 |
| 4. Conductor minimum range:                   | 0.19 to 1.18 in (4.8 to 30 mm) |
| 5. Cantilever Strength:                       | 2,800 lbs. (1,270 kg)          |

- 6. Approximate weight: 18 lbs. (8.2 kg)
- d. Shall be furnished with a ground stud.
- e. The sensor shall have at bottom of the device threaded hole compatible with a 3/4"-10 UNC bolt, used for installing the device on a crossarm or equivalent structure.
- f. Shall have a "H1" or equivalent sign molded-in at the top of the device that appropriately marks the polarity of the sensor.
- g. Conductor Keepers:
  - 1. The device shall be furnished with aluminum keepers or clamps (2 per device) used for establishing the connection of the device to the conductor.
  - 2. Each keeper shall have a reversible construction so that the same keeper accommodates the entire range of conductors' sizes.
  - 3. Each keeper shall be able to secure the device using two bolts and lock washers to be supplied with the sensor.
- h. Shall be furnished with aluminum grounding plate and all necessary hardware.
- i. The device shall be furnished with a sensor output receptacle compatible with a 4-wire signal cable plug. This receptacle is to be located at the bottom part of the sensor.
- j. The device shall be supplied with a compatible output cable. This cable shall have a compatible connector on end that connects to the sensor and pigtail termination on the opposite end. Cable length shall be at least 20 ft.

9.2. Overhead Neutral Current Sensor

- a. Used to sense neutral current in capacitor banks.
- b. The sensor shall be furnished with a tilt-top opening that suits conductors up to 1.25 inches.
- c. The sensor shall be furnished with a 35 ft. minimum length output cable. This cable shall be bare conductors at its end.
- d. Sensor shall be watertight.
- e. Electrical Ratings:
  - 1. Insulation Voltage Class: 600 V
  - 2. Output Ratio: 50 A = 5 VAC
  - 3. Required Load Impedance: 200 k $\Omega$ , minimum.
  - 4. Accuracy: 1%

## 10. Inspection

The acceptance of any material or 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/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 1: Warehouse Identification Information

Warehouse Catalog	Asset Suite	Type	Compatible Manufacturer	Model
014-84525	84525	OH Line Sensor Post	Lindsey	9E650/E1106/G with cable 9620/20
014-85358	85358	Neutral Current Sensor	Lindsey	R-22981

— End of Specification —



## Appendix

### Appendix 1: Table of Compliance for Line Post Sensor

Line	Criteria	Description	Pass/Fail (P/F)
1	Specification	The Proponent complies with the corresponding specification document.	
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ANSI, ASTM)	
3	Electrical Requirements	<ul style="list-style-type: none"> <li>• Voltage Class: 15 kV</li> <li>• Frequency: 60 Hz</li> <li>• Basic Insulator Level: 110 kV</li> <li>• Leakage Distance, minimum: 19.9 in</li> <li>• Dry arc distance, minimum: 8.8 in</li> <li>• Partial discharge test voltages: 11 kV</li> <li>• Current output: 600 A: 10V</li> <li>• Voltage Divider Ratio: 1400:1</li> <li>• Voltage signal output accuracy and Phase shift: <math>\pm 1\%</math>, <math>0^\circ \pm 1^\circ</math></li> <li>• Current signal output accuracy and Phase shift: <math>\pm 1\%</math>, <math>0^\circ \pm 1.5^\circ</math></li> </ul>	
4	Mounting	<ul style="list-style-type: none"> <li>• The sensor shall have at bottom of the device threaded hole compatible with a 3/4"-10 UNC bolt.</li> </ul>	
5	Grounding	<ul style="list-style-type: none"> <li>• Shall be furnished with a ground stud.</li> <li>• Shall be furnished with aluminum grounding plate and all necessary hardware.</li> </ul>	
6	Sensor and Markings	<ul style="list-style-type: none"> <li>• Shall have a "H1" or equivalent sign molded-in at the top of the device that appropriately marks the polarity of the sensor.</li> <li>• The device shall be furnished with a sensor output receptacle compatible with a 4-wire signal cable plug. This receptacle is to be located at the bottom part of the sensor.</li> </ul>	
	Construction	<ul style="list-style-type: none"> <li>• Material: hydrophobic cycloaliphatic epoxy</li> <li>• Approximate height to conductor: 9.4 in</li> <li>• Operating temperature range: -45°C to +55°C</li> <li>• Conductor minimum range: 0.19 in to 1.18 in</li> <li>• Cantilever Strength: 2,800 lbs. (1,270 kg)</li> <li>• Approximate weight: 18 lbs.</li> </ul>	
	Conductor Keepers	<ul style="list-style-type: none"> <li>• The device shall be furnished with aluminum keepers or clamps (2 per device) used for establishing the connection of the device to the conductor.</li> <li>• Each keeper shall have a reversible construction so that the same keeper is accommodates the entire range of conductors' sizes.</li> <li>• Each keeper shall be able to be secured to the device using two bolts and lock washers to be supplied with the sensor.</li> </ul>	
	Cable	<ul style="list-style-type: none"> <li>• The device shall be furnished with a sensor output receptacle compatible with a 4-wire signal cable plug.</li> <li>• The device shall be supplied with a compatible output cable.</li> </ul>	



### Appendix 2: Table of Compliance for Neutral Current Sensor

Line	Criteria	Description	Pass/Fail (P/F)
1	Specification	The Proponent complies with the corresponding specification document.	
2	Industry Standards	The Proponent complies with the industry standards established in the specification document. (ANSI, ASTM)	
3	Construction	<ul style="list-style-type: none"><li>• Sensor shall be furnished with a tilt-top opening that suits conductors up to 1.25 inches.</li><li>• Sensor shall be watertight.</li></ul>	
4	Cables and Accesories	Sensor shall be furnished with a 35 ft. minimum length output cable. This cable shall be bare conductors at its end.	
5	Electrical Ratings	<ul style="list-style-type: none"><li>• Insulation Voltage Class: 600 V</li><li>• Output Ratio: 50A=5VAC</li><li>• Required Load Impedance: 200 kΩ, minimum.</li><li>• Accuracy: 1%</li></ul>	











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Final Audit Report

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