



Equipment Specification

Document No: 4350.233

Asset Suite: 82917

Originating Department: Distribution Engineering

SEL651R-2 Relay and Enclosure Cabinet for Eaton Nova 15 Three-Phase Recloser



1. Introduction

This is a general specification that covers the minimum requirements for the SEL651R-2 and Enclosure/Cabinet for the Eaton Nova 15 Three-Phase recloser with 19-pins control cable to be 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 PREPA / LUMA on previous orders, will not have to furnish samples at bid opening. The 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. Quantity/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 PREPA's and/or 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, item number, name and size, net and gross weight, manufacturer's name, and lot number.
- 4.2. Packaging labels and tags shall be waterproof.

5. Equal or Approved Equal to

Schweitzer Engineering Laboratories, catalog number: SEL651R-2



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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)

One (1) 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. Controller Physical Requirements:

- a. All mechanism and electrical housing must be weatherproof. Equipment supplied must be adequate for an operating temperature range of 0°C to 50°C (32°F to 122°F), with humidity up to 100%.
- b. Supports must be provided for anchoring incoming cables and grounding. Door and locking devices must be provided with a clasp for padlocking.
- c. Control cabinet must be stainless steel with a single door and rear pole mounting bracket compatible with concrete or steel pole. Must be sized to sufficiently contain all other power supply, communication, and battery equipment.

9.2. Controller Features:

- a. The controller must be compatible with Eaton Nova 15 Three-Phase Recloser. It must include the appropriate female-type connection port for a 19-pin control cable interface.
- b. As a minimum, one 10/100 Base-T copper Ethernet port and two EIA-232 serial ports for SCADA communication, one Ethernet port or USB port for programming.
- c. Six voltage sensor inputs.
- d. Loop-Scheme control logic capability.



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- e. The recloser controller must have integral transceiver allowing communication directly between the recloser and a laptop using a local port. This port will allow LUMA Energy to access the controller locally with a laptop using the controller software to operate and interrogate (upload/download) the recloser.
 - f. The controller must have the ability to monitor the voltage on all six bushings. If a voltage monitor transducer (VMT) is required, the supplier must provide detail on how it will be configured and powered. The controller must include the appropriate male-type 4-pin connection port for low energy analog (LEA) inputs.
 - g. I/O option with two (2) 120 V-AC/125 V-DC inputs wired to monitor the two 120 V-AC PT secondary connections. Will include five (5) 12V-DC inputs.
- 9.3. The controller must be SCADA capable with DNP 3.0 protocol must include, as a minimum, the following:
- a. Three-phase status and control
 - b. Local/remote status
 - c. Profile 1 (three-phase control) status and control
 - d. Recloser function – status and control
 - e. Hot-line tag status and control
 - f. Primary voltage (both sides)
 - g. Primary phase current
 - h. Battery test and status
 - i. AC control power present
 - j. Shutdown due to control power loss
 - k. Fault indication, type, and direction
 - l. All events must be timestamped with local time
 - m. Per phase under voltage (UV) indication, for both sides
- 9.4. Accessories:



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- a. Inside the control cabinet, the equipment must provide provisions for the mounting and power of an internally installed communication device. LUMA prefers that the communication module shall accept radial/serial Ethernet-based radios as well as have a fiberoptic interface on the faceplate, to provide flexibility between radio-based and fiber-based communication.
 - b. When applicable, a polyphaser surge arrester with a N connector extending through the bottom of the controller. The inside portion of the surge protection must include a coaxial cable of sufficient length to connect the communication device to an antenna (antenna not included).
 - c. Inside the control cabinet, provide a DB-9 serial cable or Ethernet to connect the controller with a separate communication interface, which shall have the capability to accept either radio based and fiber-based communication.
 - d. The supplier must provide two knockout holes in the enclosure/cabinet for future use by the user, in addition to the power, control, and voltage sensor connectors. The supplier must provide caps for covering each knockout hole.
- 9.5. Human Interface Requirements:
- a. Must be furnished with a front panel user interface with digital display.
 - b. Must include Tri-Color LEDs and configurable labels.
 - c. Front panel must have an accessible port or USB for connecting an IBM compatible computer running Windows 10 operating system.
- 9.6. Controller Power Requirements:
- a. The controller must be capable of the operating with one-phase, 120 V AC. The controller must include the appropriate male-type 2 pin connection port for the power source to be provided externally.
 - b. LUMA prefers that the supplier provides 2 spare fuse $\frac{1}{4}$ " x $1\frac{1}{4}$ " each within the control (GFCI, relay AC input battery, and auxiliary power) shipped within the control.
 - c. 2 Position fuse block to provide fused protection for the 120 V-AC line connections of the secondary PT supplied with 30 A fuses.



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- d. Battery with sufficient reserve capacity for a minimum of 4 hours of communication operation upon loss of the auxiliary power source.
 - e. Front panel GFCI convenience receptacle with front panel replaceable fuse.
 - f. When equipped with a battery, control provides deadline operation, which allows the control to open and close the interrupters when AC power is not present.
- 9.7. Additional Requirements:
- a. All control and auxiliary devices on the recloser must be labeled per ANSI C37.2 with device numbers and/or function, including heaters.
 - b. The recloser relay/control settings must be shipped as specified or as requested by the purchaser.
 - c. Supplier must provide USB drive or other agreed-upon medium that includes the software installed on the controller.

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.

— End of Specification —

Document History

Version	1	
Date	05/20/2022	
Author	Rodolfo Flores	
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