

AUSTIN ENERGY

PURCHASE SPECIFICATION

FOR

RECLOSER, 1PH, ELECTRONIC, DISTRIBUTION, OH, 400A

<u>DATE</u>	<u>PREPARED BY</u>	<u>ISSUANCE/REVISION</u>	<u>APPROVAL SIGNATURES</u>
10/17/2012	Charles Robinson Jr, PE	Issuance	_____
11/21/2012	Brantley Gosey	Revision	_____
9/15/15	Michael Pittman, P.E.	Revision	_____

<i>REASON FOR REVISION</i>	<i>AFFECTED PARAGRAPHS</i>
11/21/12 – Correct typographical errors	Various
9/15/15 – Added requirements	5.2.4 – Manual operating handle 5.2.5 – Flash lockout beacon.

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein. Retain for future reference.

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1.0 SCOPE AND CLASSIFICATION

1.1 Scope

This specification applies to self contained single phase 15kV circuit reclosers for use on the AE overhead distribution system. The recloser shall be designed for environmentally friendly distribution pole-mounted application across a wide range of conditions. All of the unit's protection and metering functions shall be internal and electronically controlled.

1.2 Classification

The recloser will be installed on a 12.47 kV wye configured (7200V Line-Ground), single phase, 3 wire, and solidly grounded neutral circuit distribution system. The recloser will be installed below an altitude of 1000 meters and subjected to an annual ambient temperature variance of -25°C to +40°C. The average temperature for any 24-hour period will not exceed 30°C.

2.0 APPLICABLE STANDARDS

- 2.1 The equipment supplied in accordance with this specification shall comply with the applicable provisions of the latest NEMA, IEEE, ANSI/IEEE, and IEC standards relating to reclosers. In case of any conflict between any of the standards mentioned in this specification and the contents of this document, AE's specification shall govern. The applicable standards include, but are not limited to, the following:
- 2.2 ANSI/IEEE C37.60-2003 or latest revision American National Standards Requirements for Overhead, Pad Mounted, Dry Vault, and Submersible Automatic Circuit Reclosers and Fault Interrupters for AC Systems.
- 2.3 ANSI C37.61-1973/IEEE Std 321-1973 or latest revision IEEE Standard Guide for the Application, Operation, and Maintenance of Automatic Circuit Reclosers.

3.0 FUNCTIONAL REQUIREMENTS

- 3.1. The recloser unit shall be designed to detect, interrupt and reclose single phase operation of an alternating-current circuit automatically using vacuum interrupters. Reclosers using mineral oil are not allowed. The recloser must be adjustable so that only a single unit is applicable from 30 amps to 400 amps. All units must be self-powered.
- 3.2. The recloser control shall be programmable via radio control utilizing a laptop computer and shall allow the operating characteristics to be changed without de-energizing the recloser. The recloser shall also store the pertinent data (fault current magnitude, time/date stamp, etc) in non-volatile memory to assist in analysis of a power outage.

4.0 PERFORMANCE REQUIREMENTS

4.1 Ratings

4.1.1	Nominal System Voltage (kV, RMS)	12.47 kV
4.1.2	Rated Maximum Voltage (kV, RMS)	15.5 kV
4.1.3	Nominal Continuous Current (A, RMS)	400 A
4.1.4	Interrupting Current (kA, RMS, Symmetrical)	8 kA, min.
4.1.5	Frequency (Hz)	60 Hz
4.1.6	Number of Phases	1
4.1.7	Basic Insulation Level (BIL, kV)	125 kV
4.1.8	Trip Current	30-800A adjustable.

4.1.9	Arc Extinction Medium	Vacuum
4.1.10	Insulating Medium	None
4.1.11	Mechanical Operations (Open-Close)	30,000 minimum
4.1.12	Weight of Recloser	55lbs. Maximum

5.0 ADDITIONAL REQUIREMENTS

5.1 Construction

- 5.1.1 The recloser switch shall be of single housing design which houses a maintenance free magnetic actuator that provides the required force to open and close the vacuum pole assembly. A motor operated mechanism is prohibited.
- 5.1.2 The recloser shall use a solid dielectric insulation medium in each pole. The use of SF6 gas or oil for insulation or interruption is prohibited.
- 5.1.3 The recloser interrupter, drive mechanism, control, and housing shall be self-powered. External power supply shall not be required.
- 5.1.4 The recloser shall be supplied with an external position indication which shall be located to permit viewing from under the recloser.
- 5.1.5 The recloser shall have the ability to be vertically mounted if needed.
- 5.1.6 The recloser shall be provided with a manual-tripping lever actuated by extendo-stick that shall require no external power for operation.

5.2 Mechanism

- 5.2.1 The mechanism shall use one bi-stable direct drive magnetic solenoid capable of fast opening and closing operations with no recharging delay. Spring operated or high voltage solenoid mechanism is prohibited. Bi-stable means that no operating power is required to hold the unit open or closed.
- 5.2.2 The design shall permit multiple open-close operations after loss of primary control voltage to allow dead line operation. The switch shall contain no high voltage closing coils.
- 5.2.3 Any special tools or measurement devices required for routine inspection, communication, and maintenance shall be included in the bid. A minimum of 1 set of tools for every one unit ordered shall be supplied.
- 5.2.4 The recloser unit shall have a manual yellow operating handle that mimics traditional OCR reclosers.
- 5.2.5 The recloser unit shall have an amber LED lockout beacon which will flash for 4 hours min.

5.3 Vacuum Interrupters

- 5.3.1 Current interruption shall occur in vacuum interrupters.
- 5.3.2 Contact life curves shall be supplied with the bid proposal and included in the installation and maintenance manuals.

5.4 Current Sensing

- 5.4.1 A 1000:1 ratio current transformer shall be provided for protection, instrumentation, metering and shall be capable of accurately monitoring full fault duty and providing accurate readings to the full interrupting rating of the unit. The current transformers shall be embedded in the recloser.

5.5 Mounting Frame

- 5.5.1 The recloser shall be provided with a galvanized mounting frame for pole mounting.
- 5.5.2 The manufacturer shall supply bird guards, fittings and additional parts to mount and assemble the complete recloser package at the job site by AE personnel when delivered.

5.5.3. The recloser shall be supplied such that it will be ready to be assembled per manufacturer instruction without any additional parts from AE. All components shall be mounted and ready to install from the manufacturer.

5.6 Control Power

5.6.1 Control power shall be converted from load and, or fault current through the use of current transformers.

6.0 ELECTRONIC CONTROLS

6.1 Control Features (Hardware and Software)

6.1.1 The recloser shall have a microprocessor based control which shall allow the user to program any of the 11 standard recloser curves. The recloser control shall be internal to the recloser housing and shall be accessible via radio. The control shall allow the user to program minimum trip and response times, number of operations to lockout, and cold load time. The recloser control shall store event history from the last 40 over current operations and shall also have a scratch pad non-volatile memory for user entered notes.

6.1.2 The manufacturer may be requested to demonstrate that the recloser control complies with the specification prior to award recommendation. The bidder will have five working days to comply with this request, after being notified by AE to comply with such request. Failure to comply with the request may be grounds for bid rejection. The demonstration shall be given in Austin, Texas at no expense to AE. Should the control being demonstrated not comply with all aspects of the specification then the bid may be rejected at the sole discretion of AE System Engineering.

6.1.3 User-settable 30 to 800 Amp minimum trip

6.1.4 Auto reclosing control – four shot control

6.1.5 Event reporting and sequential events recorder

6.1.6 Over current protection – fast and delay curves.

6.1.7 All software and firmware including operation and communication software shall be provided with the latest version at time of delivery.

6.2 Batteries

6.2.1 The recloser assembly will be purchased and shipped with DC storage batteries. The bayonet battery shall be designed to be replaced with a hot stick while the recloser is still in service. The battery shall be sized to run the Radio and the control for at least 10 hours with no presence of AC power. Complete battery design documentation shall be supplied with the bid for review and approval by AE.

6.3 Radio Hardware

6.3.1 The primary means of communication to the recloser shall be via a High Performance SiFlex Remote Radio Model Number PSC8620073, 900 MHz spread spectrum (38.4Kbps) or functional equivalent.

6.3.2 A High Performance SiFlex Local Radio Model Number PSC8620062, 900 MHz spread spectrum (38.4Kbps) or functional equivalent shall be installed and shipped with each recloser delivered.

7.0 TESTS

7.1 The recloser shall be tested in accordance with ANSI/IEEE C37.60, section 7, before shipment. Two (2) copies of certified Production Test reports shall be furnished to verify correctness of control wiring and proper functioning of all equipment. These test reports shall be submitted to AE no later than two (2) week prior to agreed delivery date.

7.2 One (1) copy of the latest certified Design Test for the recloser shall be submitted with the bid package.

8.0 EQUIPMENT IDENTIFICATION

8.1 Each recloser will have an attached metal nameplate containing, as a minimum, the following information:

Manufacturers' Name:
Manufacturers' Model Number:
Manufacturers' Serial Number:
Control Voltage in Volts:
Date of Manufacturing:
Recloser Maximum Rated kV:
Maximum Interrupting Rating:

9.0 EQUIPMENT SHIPPING

- 9.1 Each recloser and controller shall be shipped in an individual crate and packaged to prevent any damage to the exterior of any internal equipment. The production test reports shall be logged in the recloser's event log. Each recloser shall be shipped with programming software on a CD and installation instructions in a weatherproof plastic bag. The shipping crate will contain legible markings showing the Purchase Order Number, the commodity number of the recloser stated on the purchase order and the name plate information if not readily visible with the recloser inside the crate.

10.0 SERVICE AND MAINTENANCE AND RELIABILITY

- 10.1 No field calibration shall be required to maintain accuracy of the recloser switch.
- 10.2 The recloser manufacturer shall provide a Diagnostic and troubleshooting software at no cost. Future upgrades for the Recloser Controller software shall be downloadable in the field from a PC and will have no additional cost to AE. There will be no annual cost to continue use of the Recloser Controller software.
- 10.3 The recloser manufacturer shall provide one (1) copy of any software for installation and operation and installation and related operation manuals at the time of shipment of each recloser.
- 10.4 The Manufacturer shall provide a current list of five (5) customer's address, name(s), and telephone number using the recloser being bid.