

Three-Phase Pole Mounted Recloser

With a Control Panel



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GENERAL

1.1 This material specification states the requirements for automatic circuit reclosers to be purchased by Public Utility District #1 of Chelan County for applications on 12.47 kV distribution feeders. Reclosers shall be rated for a minimum of 15.5 kV, 110 kV BIL, 560 amp, 12.5 kA interrupting, 4 cycle interrupting time, and 10,000 switching cycles. The voltage transformer shall be rated 7.2 kV, 2 bushing, and meet CPUD specification 1212.01. An Eaton/Cooper Form 4D control in NEMA 3R rated cabinet is required.

1.2 REFERENCES

The following publications shall be used in conjunction with this material specification, and form a part of this material specification to be the extent specified herein. When a referenced publication is superseded by an approved revision, the latest revision shall apply.

1.2.1 ANSI C37.60 – Requirements for Overhead, Pad Mounted, Dry Vault, and Submersible Automatic Circuit Reclosers and Fault Interrupters for AC Systems.

1.2.2 ANSI C37.61 – IEEE Standard Guide for the Application, Operation and Maintenance of Automatic Circuit Reclosers.

1.2.3 ANSI C37.90.1 – IEEE Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus.

1.2.4 ANSI C62.41.1 – IEEE Standard in Low Voltage (1000V and less) AC Power Circuits.

1.2.5 ASTM D 117 – Standard Guide to Tests Methods and Specifications for Electrical Insulating Oils of Petroleum Origin.

1.2.6 ANSI C37.85 – American National Standard Requirements for x-radiation limits for AC high voltage power switchgear.

2.0 TYPE

The recloser shall be vacuum interrupter encapsulated in a solid dielectric insulator, 60 Hz, dead tank, with a single supporting frame work for all three poles. The recloser shall be pole mounted, with a frame mounted voltage transformer. Oil or SF6 is not allowed.

2.1 TYPE OF OPERATING MECHANISM

The operating mechanism shall be trip free and anti-pumping. The supplier shall furnish all components completely factory installed – including frame and transformer. The mechanism shall have both electrical and mechanical energy to open the recloser after a close operation.

2.2 OPERATING MECHANISM COMPARTMENT

A NEMA 3R compartment, at minimum, shall be furnished to house the operating mechanism and the charging motor, if applicable. The supplier shall furnish all connections between this



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compartment and the control compartment. The operating mechanism compartment shall contain neither low-voltage fuses nor low-voltage circuit breakers. Such devices, if necessary, may be installed near the control compartment, and shall be installed in such a way as to be easily accessible for replacement.

2.3 AUXILIARY POWER AND CONTROL WIRING

Auxiliary power and control wiring shall be completely factory installed. Control cable and cable coupling fittings shall be provided to make all of the connections necessary to assure complete operation of the recloser. Auxiliary power and control wiring shall consist of stranded copper wire, 600 volt class, with insulation or outer covering that is flame retardant, heat resistant, oil resistant, and moisture resistant. Any wiring running outside of weatherproof compartments shall be in rigid steel or flexible UV resistant weather proof conduit, or shall be weatherproof control cable. Both ends of all wires and terminal blocks shall be clearly marked with the designation shown on the supplier's wiring diagrams.

2.4 CONTROL COMPARTMENT

2.4.1 A NEMA 3R rated cabinet, at minimum shall be furnished to house control equipment and terminal blocks. The compartment door shall be removable, and a secure location for padlocking shall be incorporated on the unit. The cabinet shall be furnished with two locking sleeves and pole mounting hardware. The control compartment cabinet shall be removable with a minimal amount of disassembly.

2.4.2 The interior of the compartment shall have a vertically hinged panel. The controls, terminal blocks, and other devices requiring access for operation and maintenance shall be mounted in the compartment.

2.4.3 The compartment shall be furnished with space heaters sufficient to eliminate condensation and prevent LCD display impairment at temperatures in the range of -40C to 40C. Each heater shall be controlled by a thermostat. The thermostat(s) shall be adjustable, and the adjustment provisions shall include clear indication of at least three specific temperatures on the adjustment range.

2.4.4 The compartment shall be furnished with one 120 VAC duplex convenience receptacle.

2.4.5 An Eaton/Cooper Form 4D controller mounted inside the control compartment supplied with the unit is required. The control shall be ready to accept a radio for future SCADA connection. The control must meet ANSI C37.90.1 and C37.90.2 surge protection. The controller must be the same as previous models Chelan PUD operates.

2.4.6 All components in the cabinet must be rated for 40 year life span, except the battery which must be rated a minimum of 60 months. The battery must be furnished with a means to load test it. The battery must be accessible and easily removable by one person. Covers over the battery are required. The battery shall be a single 24 volt, 8 amp hour battery.



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2.4.7 A 45 foot control cable, and the auxiliary voltage supply cable, shall be furnished with the unit.

2.4.8 The recloser control shall function independently of any external DC voltage supply. The 120 volt auxiliary power for the control panel shall be furnished from a frame mounted voltage transformer. The transformer must have two primary bushings and meet Chelan PUD's Material Specification 1212.01. Transformer must be pre-mounted and pre-wired to the recloser frame.

2.4.9 The recloser shall be furnished with all necessary current transformers for control sensing, minimum of three 1000:1 CTs. If the control is powered by CTs, these shall be separate sets dedicated for that purpose only, and shall not be part of any metering, relaying, voltage sensing, or other purposes. There shall be a minimum of three load side voltage sensors. Dual ratio CTs are not allowed.

2.4.10 After any loss of 120 VAC power, the recloser close and trip operations shall function for at least eight hours. For the eight-hour period, the recloser shall be capable of at least one close and two open operations. The controller must keep all settings regardless of length of power loss.

2.4.11 In the control cabinet, a switch shall be furnished which displays, when enabled, the number of recloser opening operations.

2.4.12 The recloser shall include internal voltage sensors to provide source voltage sensing.

3.0 BUSHINGS

3.1 The bushings shall be ANSI light grey in color. The bushings shall be silicon polymer or cycloaliphatic epoxy with clamp-type terminals in accordance with ANSI C57.15, latest revision.

3.2 Mechanical position indicator shall be effectively connected to the operating mechanism. GREEN shall indicate open, and RED shall indicate closed.

3.3 Manual trip lever must be provided, clearly visible and appropriately labeled.

4.0 LINE CONNECTORS

4.1 The recloser shall be equipped with clamp-type terminals and shall be marked according to the latest revision of ANSI C57.15.

4.2 The clamp-type terminal shall be able to terminate cables ranging from #6 copper to 500 MCM aluminum.

4.3 The clamp-type terminal shall be capable of being tightened with a 9/16 inch Fargo wrench (Fargo Manufacturing, Catalog No. GP-203).



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4.4 The recloser shall be furnished with a set of wildlife guards. The guards shall cover each of the six recloser bushings as well as the transformer bushings and the arresters.

5.0 MAINTENANCE CLOSING DEVICE AND TOOLS

5.1 Any special tools shall be supplied with the recloser.

5.2 A complete price list of spare parts shall be included each quote.

6.0 NAMEPLATES

6.1 The recloser nameplate and instruction plates shall show all values in U.S. customary units.

6.2 Each recloser shall be provided with two nameplates mechanically fastened; one mounted on the control enclosure and the other mounted on the recloser. Nameplates shall be made of stainless steel or laser etched anodized aluminum and permanently marked with essential operating data as specified in the latest revision of ANSI C57.15.

6.3 All nameplates shall have the manufacturer's serial number bar-coded into the nameplate. Manufacturer identification characters shall not be included as part of the barcode. This barcode shall be etched into the nameplate. The character size shall be ¼ inch. The barcode shall be a minimum of 1/2-inch-high and 2-1/2 inches wide.

7.0 PAINT

7.1 The finish on metal parts shall be ANSI light grey.

7.2 The supplier shall furnish one quart or one spray can of touch up paint with each recloser.

8.0 EXTERNAL HARDWARE & ARRESTERS

8.1 All external fasteners and hardware (such as bolts, screws, washers, hinges and handles) shall be stainless steel; except all nuts shall be silicon-bronze to prevent seizing.

8.2 Source and load side arresters are required. MOV rated 9 KV, 7.65 MCOV with isolator per CPUD Material Catalog #1410.01.

9.0 MOUNTING FRAME

9.1 The recloser, voltage transformer and all auxiliary components shall be shipped completely factory assembled on its mounting frame. The frame and all miscellaneous assembly equipment shall be galvanized steel, 304 steel, or aluminum.



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10.0 VOLTAGE TRANSFORMER

10.1 The transformer shall provide 120 VAC source for the control panel and recloser electronic equipment.

10.2 The transformer shall meet CPUD specification 1212.01. It shall be a two bushing style unit, approximately 0.5 kva.

10.3 The voltage transformer shall not be supplied with a fuse.

11.0 DRAWINGS

11.1 Each unit shall be supplied with two hard copies and an electronic copy of all drawings.

11.2 Drawing shall be full-sized, not reduced.

11.3 All values and information on drawings shall be in U.S. customary units.

11.4 Supplier shall provide as-built drawings specific to each recloser unit.

11.5 Certified test reports shall be provided for each unit before shipping the unit from the factory. The test reports shall include interrupter ratings, load current, line charging and cable charging, dielectric ratings, continuous current heat run and mechanical life.

12.0 SHIPPING INSTRUCTIONS

12.1 The supplier shall notify Chelan PUD Distribution Engineering two weeks prior to the expected arrival of the unit(s). Additionally, the CPUD Warehouse Foreman shall be notified 48 hours prior to the expected delivery.

13.0 PACKAGING

13.1 The supplier shall place the recloser and associated equipment in a water proof, vapor proof sealed package.

13.2 The package shall be packed in a cushioned and reinforced shipping container.

13.3 The packaging must be constructed for fork lift picking.

13.4 The recloser shall not have items stacked on top of it.



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14.0 WARRANTY

14.1 All parts, materials and workmanship of each unit shall be warrantied for a period of 60 months after the receipt of the unit. Warranty work must be completed within 60 day of notice of failure from the District.

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