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GUAM POWER AUTHORITY
P.O. BOX 2977
HAGATNA, GUAM 96932

TRANSMISSION & DISTRIBUTION SPECIFICATION


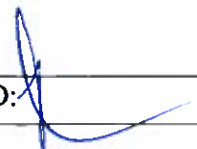
Specification No. E-054


FOR

OVERHEAD THREE PHASE RECLOSER

AND

RECLOSER CONTROL BOX UNIT

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OVERHEAD THREE PHASE RECLOSER AND RECLOSER CONTROL BOX UNIT

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1.0 SCOPE

- 1.1 This specification covers GPA requirements for a SCADA controlled, automatic three phase, solid dielectric vacuum recloser for the distribution system at 13.8kV. The recloser shall be compatible and controlled by a SEL-651RA relay.
- 1.2 The recloser is intended for use in tropical weather conditions with a corrosive sea air atmosphere, sustained wind strengths as required by the 2018 International Building Code (IBC).

2.0 APPLICABLE PUBLICATIONS

The recloser shall meet the requirements of the following standards, including the latest revisions with respect to material, design and tests.

AMERICAN NATIONAL STANDARDS INSTITUTE

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

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


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

ANSI C62.41.1 – IEEE Standard Guide on the Surge Environment in Low-Voltage (1000V or less) AC Power Circuits.

ANSI C62.41.2 – IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000V and less) AC Power Circuits.

ANSI C37.85 – American National Standard for AC High Voltage Power Vacuum Interrupters –Safety Requirements for X-Radiation Limits.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION


IEC 60068-2-30 – International Standard for Environmental Testing – Part 2-30: Tests – Test Db: Damp Heat, cyclic (12h + 12h cycle)

IEC 62271-111 – International Standard for High-Voltage Switchgear and Controlgear – Part 111: Automatic Circuit Recloser and Fault Interrupters for AC Systems up to 38kV.

3.0 DEVIATIONS AND NON-CONFORMANCE REQUIREMENTS

- 3.1 Deviations from this specification or changes in the material or design after the purchase order has been placed must be approved by the GPA Engineering Department and acknowledged by a Purchase Order Amendment issued by GPA.
- 3.2 Units received with deviations or non-conformances that are not acknowledged per Section 3.1 are subject to rejection. The Supplier of rejected units is responsible for any corrective action including but not limited to materials, labor and transportation necessary to dispose of or make the units conform to the specification.
- 3.3 Notification of defective units discovered before or after installation that are believed to be inherent to manufacturing problems or workmanship shall be made and forwarded to the Supplier. The description of the item, documentation of the problem and the described information, disposition and/or follow-up (as appropriate) that GPA expects from the Supplier will be specified. The Supplier's response shall be made within thirty (30) days unless an extension is acknowledged and approved in writing by the GPA Manager of Engineering.
- 3.4 Warranty -- the Supplier shall warrant the distribution recloser to be free from defects in material and workmanship under normal use and service conditions. The term of the Warranty shall be the lesser of twelve (12) months from the date of initial installation or eighteen (18) months from date of receipt.
- 3.5 Statement of Compliance - The Supplier shall provide a signed statement verifying that the products being supplied fully comply with the specifications and drawings. Items not in full compliance with the specifications and drawings will be identified with a description of the deficiency and any proposed substitutions. Items not in full compliance with the specifications and drawings must be approved by the GPA Engineering Department, as described in Section 3.1.

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4.0 SUBMITTALS

- 4.1 The bidder shall provide the following data with their bid submittal:
- a. Nameplate Data
 - b. Connection Diagrams
 - c. Shop Drawings
 - d. Estimated Weight
 - e. Equipment and Devices Country of Origin
 - f. Completed Appendix A – **OVERHEAD THREE PHASE RECLOSER INFORMATION SHEET**
 - g. Completed Appendix B – **CONTROL BOX UNIT INFORMATION SHEET**
- 4.2 Drawings and wiring diagrams for approval shall be submitted to GPA three to four (3-4) weeks after receipt of order. GPA shall be allowed two (2) weeks to review submitted drawings and wiring diagrams for final approval without affecting the shipping date. Delays in delivery due to drawings that were disapproved during this review period shall be the responsibility of the Supplier.
- 4.3 Approved drawings returned to the Supplier shall be considered as authorization to proceed with the work. The approval of GPA shall in no way abrogate the requirements of this specification.

5.0 SPECIFICATIONS

- 5.1 The three-phase recloser shall be of 15kV voltage class.
- 5.2 Maximum System Voltage shall be 15.5kV.
- 5.3 Required BIL shall be 110kV.
- 5.4 Continuous and Load Break Current shall both be rated at 800 Amps.
- 5.5 Overload rating at 20°C for 8 hours shall be 960 Amps.
- 5.6 60 Hz Withstand, kV rms Dry 1 minute: 50kV
- 5.7 60 Hz Withstand, kV rms Wet 10 seconds: 45kV
- 5.8 Interrupting Rating RMS shall be 12.5 kA.

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5.9 Asymmetrical Making Current RMS shall be 20kA and Asymmetrical Making Current PEAK shall be 32kA.

5.10 Symmetrical Short Circuit Current in 3 seconds shall be 12.5kA.

5.11 Mechanical Operation: 10k

5.12 Temperature Range: -40°C to +65°C (-40°F to 150°F)

6.0 DESIGN

6.1 The Recloser Unit shall come completely assembled with the following:

6.1.1 Vacuum Interrupter – The recloser shall have three (3) epoxy insulated “L” style vacuum interrupter modules.

6.1.2 Shall include one (1) three phase magnetic actuator operator to provide three phase operation.

6.1.3 Manual Trip Handle – The manual trip handle shall be hot stick operable and provide mechanical and electrical lockout of the closing circuit when the lever is in the tripped position. Additionally, the relay shall be completely disabled to prevent remote and or relay manual switching while in the tripped position.


6.1.4 Position Indicator – The position indicator window shall be clearly visible. Green shall indicate open, and RED shall indicate closed.

6.1.5 Current Transformer – Provide three (3) each 1000/500:1 Current Transformers encapsulated within the solid dielectric insulation which will be used exclusively for the recloser control.

6.1.6 Voltage sensor/ Voltage transformers – Six (6) each capacitively coupled voltage sensors with 2500:1 ratio shall be integral to each line and load side. Sensors will be used exclusively for the recloser control.


6.1.7 Control Wiring – The Control cable shall be approximately 30 feet in length with 14 pin connectors on both ends (Part # B1341 3036 C00).

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- 6.1.8 AC Power Wiring – AC power cable shall be approximately 30 feet in length with 2 pin connectors on both ends (Part # B1341 3030 C00) to connect to 120 VAC via the control.
- 6.1.9 Voltage Sensing Cable - Voltage Sensing Cable shall be approximately 30 feet in length with 8 pin connectors on both ends (Part # B1341 5241 C00).
- 6.1.10 Connectors - Connectors at the recloser must be provided to prevent any crossings of the Control, AC power, or Voltage sensing cables.
- 6.1.11 Primary Lugs – Six (6) each copper 4-hole Tinned NEMA primary lugs shall be provided.
- 6.1.12 Grounding Lugs – Brass eyebolt style ground lugs for grounding connection shall be provided with ground connectors for up to 4/0 copper wires.
- 6.1.13 Nameplate – Must be visible and contains the essential ratings of the recloser unit.
- 6.1.14 Pole Mounting Frame – Frame must be either 304L Stainless steel or Aluminum with provisions for lightning arrester mounting. Mounting holes must be compatible with 5/8” bolts. GPA concrete poles have pre-drilled holes on them which allows installation of a pole mount site-ready assembly. Spacing of mounting holes shall be able to accommodate 20” - 22” hole spacing.
- 6.1.15 Wildlife protectors – The recloser shall come with six (6) high impact, UV stable wildlife protectors for the primary connection point and load insulators.
- 6.1.16 Bushings – Shall be air insulated, removable silicone insulators over an IEEE bushing interface. Provide six (6) each 800 Amp interfaces with screw-on silicone insulators.
- 6.1.17 Mechanism Enclosure – Light gray painted stainless steel tank.
- 6.1.18 Recloser Test – Each individual recloser shall undergo a Factory Production Test which includes a mechanical test, hi-pot, circuit resistance and timing test. Recloser shall comply with the IEEE C37.60-2013 and IEC 62271-111 standard ratings.

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6.1.19 Recloser unit shall have an operation counter and lifting provisions such as support or an anchor.

6.1.20 Recloser must be compatible with SEL-651RA Recloser Control (CAT # 0651RA01XGAXAE1A121CBA0X) manufactured by Schweitzer Engineering Laboratories.

6.1.21 Recommended Manufacturer: G&W Electric (CAT # VIP378ER-12S).

6.2 Control Box Unit shall be comprised of the following components:

6.2.1 Relay – Relay shall be traditional retrofit recloser control (14 pin) with Automatic Network Reconfiguration, Harmonic Analysis, Six Voltage Inputs, EZ settings, Power Quality Monitoring, 8 settings group, template storage, SEL Fast Sequence of Events Recorder, DNP3 Level 2 Outstation, 120/230 VAC Power Supply, and integral battery charger.

6.2.1.1 Relay shall have six (6) Secondary Input Voltage rating of 8VAC Max LEA and Secondary Input Current rating of 1Amp for phase and 0.2 Amp for neutral. Shall also contain a 12V, 16 Amp-hours battery.


6.2.1.2 Connectors: Low-Voltage Close Connectors shall be 2-Pin Female and LEA Voltage Input Connectors shall be 8-Pin (MS26482 Size 12).

6.2.1.3 Communication Interface shall be Two (2) 10/100 Base-T, EIA 485. Communication Protocol, Firmware and User Interface uses standard option.

6.2.1.4 Accessories – Shall come with a 2-Pin Male connector for Incoming Power (MS5015 Size 22), SEL 2401 Satellite Synchronized Clock and accessory mounting kit with 12V Aux Terminal Block and 100W heater. Enclosure shall be painted Aluminum with Standard outlet.

6.2.1.5 Relay shall be SEL-651RA Recloser Control (CAT # 0651RA01XGAXAE1A121CBA0X) manufactured by Schweitzer Engineering Laboratories and compatible with SEL

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Accelerator Quickset Program. Relay must also be compatible with G&W Electric (CAT # VIP378ER-12S) unit.

- 6.2.2 Communication Device – Shall be SEL-2925 Bluetooth Transceiver (CAT #29250110X) manufactured by Schweitzer Engineering Laboratories. Bluetooth transceiver shall have an indoor antenna, approved for unlicensed use in the United States including Guam and must be compatible with SEL Accelerator Quickset Program and SEL-651RA Recloser Control.
- 6.2.3 Battery backup power – After loss of 120VAC power, the recloser close and trip operations shall function for a minimum of 8 hours and must keep all settings regardless of length of power loss.
 - 6.2.3.1 Replacement Battery Kit – Replacement battery shall have a normal capacity of 16amp-hours at 25°C. Run time of over 25 hours at +25°C and over 8 hours at -40°C. Recharge time shall be less than 23 hours at 25°C. Estimated life shall be over 4 years at 25°C and over 1 year at 80°C. Shall be SEL-915900200 (CAT #91500200) manufactured by Schweitzer Engineering Laboratories and must be compatible with SEL-651RA Recloser Control.
- 6.2.4 Connectors - Connectors at the recloser must be provided to prevent any crossings of the Control, AC power, or Voltage sensing cables.
- 6.2.5 Grounding Lugs – Ground lugs for grounding connection shall be provided with ground connectors for #4 to #2 copper wires.

7.0 QUALITY CONTROL

- 1.1 The Supplier shall have a quality control program to ensure compliance with the requirements of this specification. The program shall be documented and available for GPA's review if requested.
- 1.2 Documentation of the quality control program shall indicate where in the production and manufacturing process the quality checks are taken, describe the purpose of the checks, and describe the nature of the check, e.g. if check is visual only or if electrical or mechanical testing is used.

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8.0 PACKING AND SHIPPING

- 8.1 The supplier shall have adequate work and inspection instructions for handling, storage, preservation, packaging and shipping to protect the quality of the recloser and all attachments and to prevent damage, loss and deterioration of the recloser and its appurtenances.
- 8.2 The recloser shall be placed and crated with suitable material to prevent damage and injury during shipment and handling operations.
- 8.3 The recloser shall be securely blocked to prevent shifting during transit.

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Appendix A

OVERHEAD THREE PHASE RECLOSER INFORMATION SHEET

NOTE: Please complete the product information and provide the required documents. Incomplete information shall be cause for rejection.

Product Information

Product Information			
1.	Recloser Unit		
a.	Voltage Class: 15kV	Yes	No
b.	Maximum System Voltage: 15.5kV	Yes	No
c.	BIL Rating: 110kV	Yes	No
d.	Continuous and Load Break Current: 800 Amps	Yes	No
e.	8-Hr. Overload at 20°C: 960 Amps	Yes	No
f.	60 Hz Withstand, kV rms dry 1 minute: 50kV	Yes	No
g.	60 Hz Withstand, kV rms wet 10 seconds: 45kV	Yes	No
h.	Interrupting Rating RMS: 12.5kA	Yes	No
i.	Making Current RMS, assym.: 20kA	Yes	No
j.	Making Current PEAK, assym.: 32kA	Yes	No
k.	Short Circuit Current kA sym., 3 sec:12.5kA	Yes	No
l.	Mechanical Operations: 10k	Yes	No
m.	Temperature Range: -40°C to +65°C (-40°F to 150°F)	Yes	No
n.	Vacuum Interrupter: (3) Epoxy Insulated "L" Style	Yes	No
o.	Magnetic Actuator Operator	Yes	No
p.	Manual Trip Handle	Yes	No
q.	Position Indicator	Yes	No
r.	Current Transformer: (3) Each 1000/500:1 Ratio	Yes	No
s.	Voltage Sensor/Voltage Transformer: (6) Each Capacitively Coupled 2500:1 Ratio	Yes	No
t.	Control Wiring: 30 feet length with 14 pin connectors on both ends (Part # B1341 3036 C00)	Yes	No
u.	AC Power Wiring: 30 feet length with 2 pin connectors on both ends for 120 VAC supply (Part # B1341 3030 C00)	Yes	No
v.	Voltage Sensing Cable: 30 feet length with 8 pin connectors on both ends (Part # B1341 5241 C00)	Yes	No
w.	Connectors provided for Control, AC Power and Voltage Sensing Cables	Yes	No
x.	Primary Lugs: (6) Each 4-hole Tinned NEMA	Yes	No
y.	Grounding Lugs: Brass eyebolt for up to 4/0 Copper Wires	Yes	No
z.	Nameplate: Visible and has essential ratings	Yes	No
aa.	Pole Mounting Frame:		
	1. 304L Stainless Steel or Aluminum	Yes	No
	2. Mounting holes compatible with 5/8" bolts and spacing of 20"-22"	Yes	No
ab.	Wildlife Protectors: (6) Each High Impact, UV	Yes	No
ac.	Bushing		
	1. (6) each 800 Amp interfaces with screw-on silicone insulators	Yes	No
	2. Air insulated; Removable cover; IEEE Bushing Interface	Yes	No
ad.	Mechanism Enclosure: Light Gray; Stainless Steel Tank	Yes	No
ae.	Operation Counter	Yes	No
af.	Lifting Support or Anchor	Yes	No
ag.	Compatible with SEL-651RA	Yes	No
ah.	G&W Electric (CAT # VIP378ER-12S)	Yes	No
Required Documents			
1.	Sample Nameplate Data	Yes	No
2.	Connection Diagrams	Yes	No
3.	Shop Drawings	Yes	No

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Appendix B

CONTROL BOX UNIT INFORMATION SHEET

NOTE: Please complete the product information and provide the required documents. Incomplete information shall be cause for rejection.

Product Information

2. Control Box Unit			
a.	Relay:		
	1. Harmonic Analysis	Yes	No
	2. Power Quality Monitoring	Yes	No
	3. Sequence of Events Recorder	Yes	No
	4. (6) Voltage Inputs	Yes	No
	5. EZ Settings	Yes	No
	6. 8 Settings Group and template storage	Yes	No
	7. DNP3	Yes	No
	8. 14-pin with Automatic Network Reconfiguration	Yes	No
	9. 120/230 VAC Power Supply	Yes	No
b.	Secondary Input Voltage: (6) 8 VAC Max LEA	Yes	No
c.	Secondary Input Current: 1 A (phase); 0.2 A (neutral)	Yes	No
d.	Communication Interface: (2) 10/100 Base-T, EIA-485	Yes	No
e.	Enclosure: Painted Aluminum	Yes	No
f.	Outlet: Standard 120VAC	Yes	No
g.	Battery: 12V; 16Ah	Yes	No
h.	Heater: 100W	Yes	No
i.	Low Voltage Close Connectors: 2-Pin Female	Yes	No
j.	LEA Voltage Input Connectors: 8-Pin (MS26482 Size 12)	Yes	No
k.	Incoming Power Connector: 2-Pin Male (MS5015 Size 22)	Yes	No
l.	Satellite Clock: SEL-2401	Yes	No
m.	Compatible with SEL Acceleator Quickset	Yes	No
n.	Compatible with G&W Electric Recloser Unit (CAT # VIP378ER-12S)	Yes	No
o.	SEL-651RA Recloser Control (CAT # 0651RA01XGAXAE1A121CBA0X)	Yes	No
p.	Communication Device: SEL-2925 Bluetooth Transceiver (CAT # 29250110X)	Yes	No
q.	Grounding Lug: for #4 to #2 Copper Wire	Yes	No
r.	Battery Backup Power: Minimum 8 hours operation	Yes	No
s.	Replacement Battery Kit: 12V; 16Ah SEL-915900200 (CAT # 915900200)	Yes	No

Required Documents

1.	Sample Nameplate Data	Yes	No
2.	Connection Diagrams	Yes	No
3.	Shop Drawings	Yes	No

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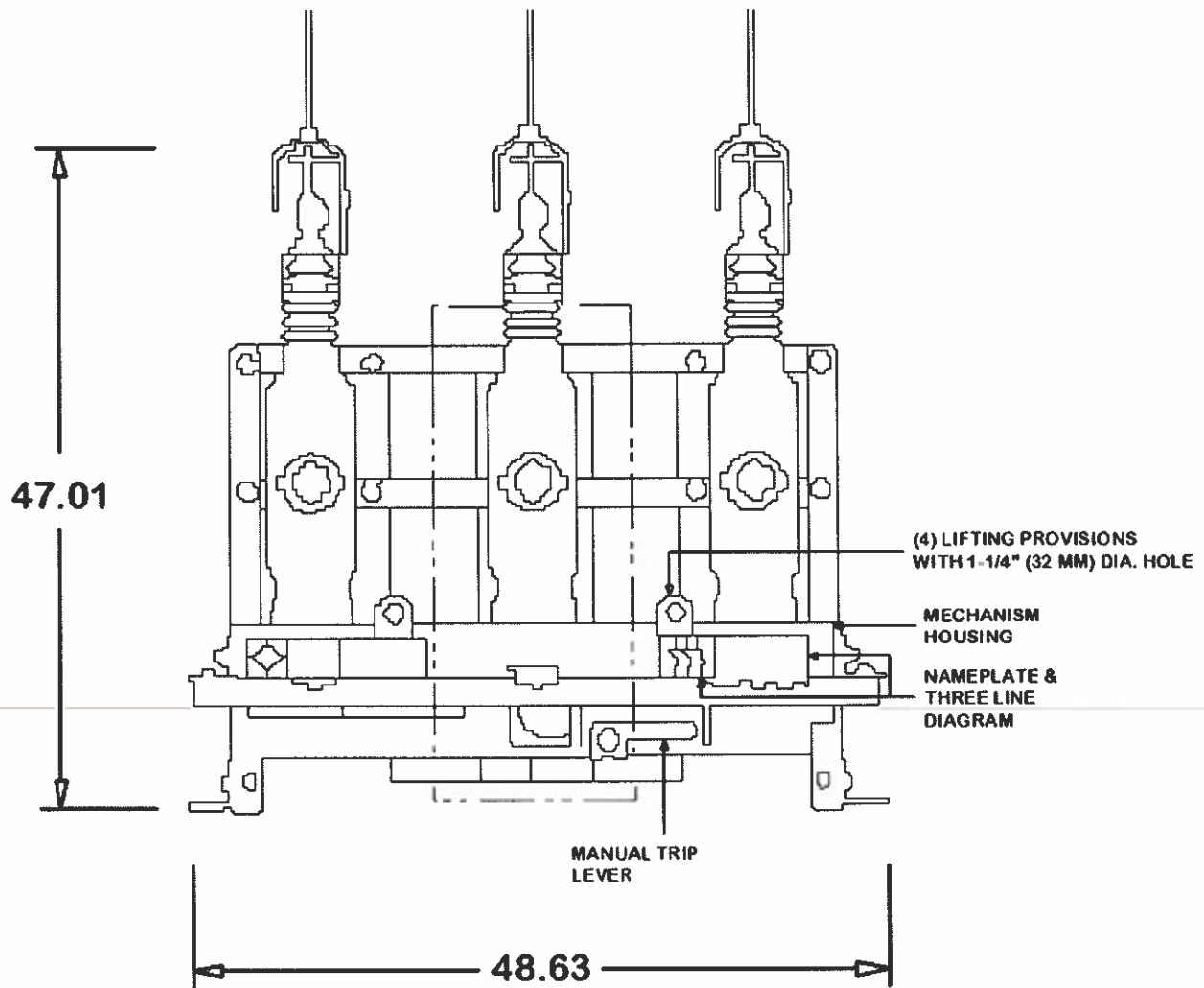
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Appendix C
OVERHEAD THREE PHASE RECLOSER LAYOUT DRAWINGS
(Dimensions are in inches)



FRONT VIEW

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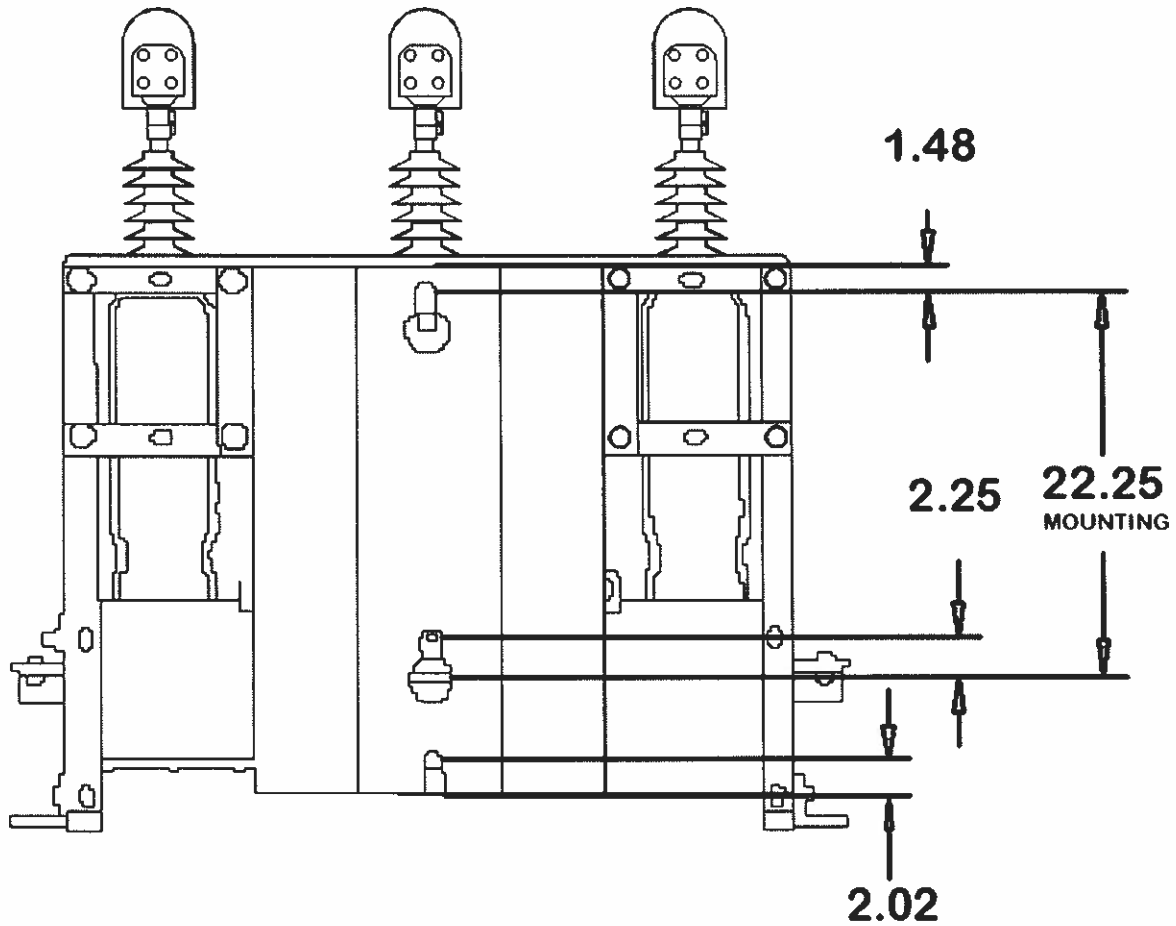
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BACK VIEW

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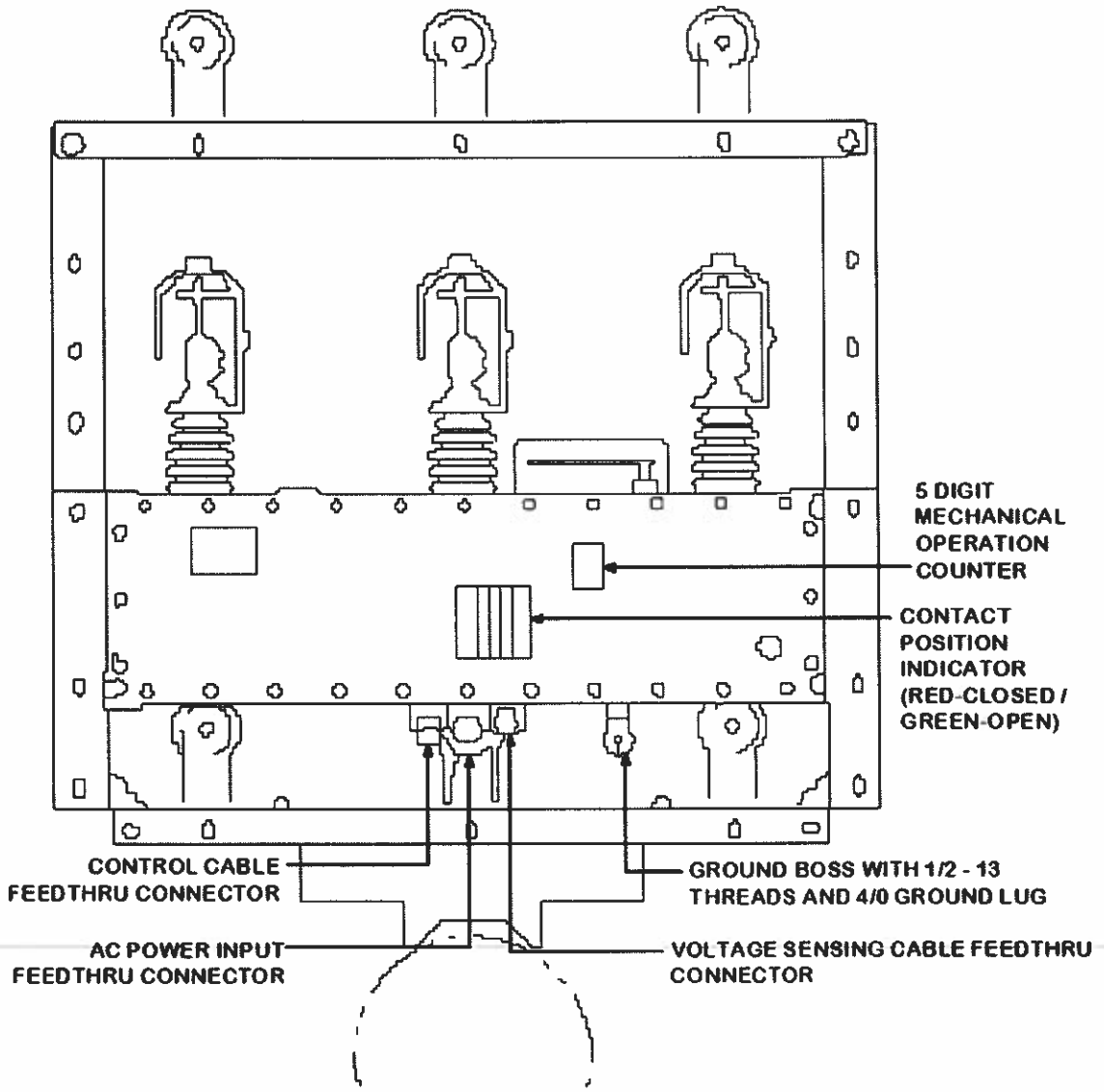
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BOTTOM VIEW

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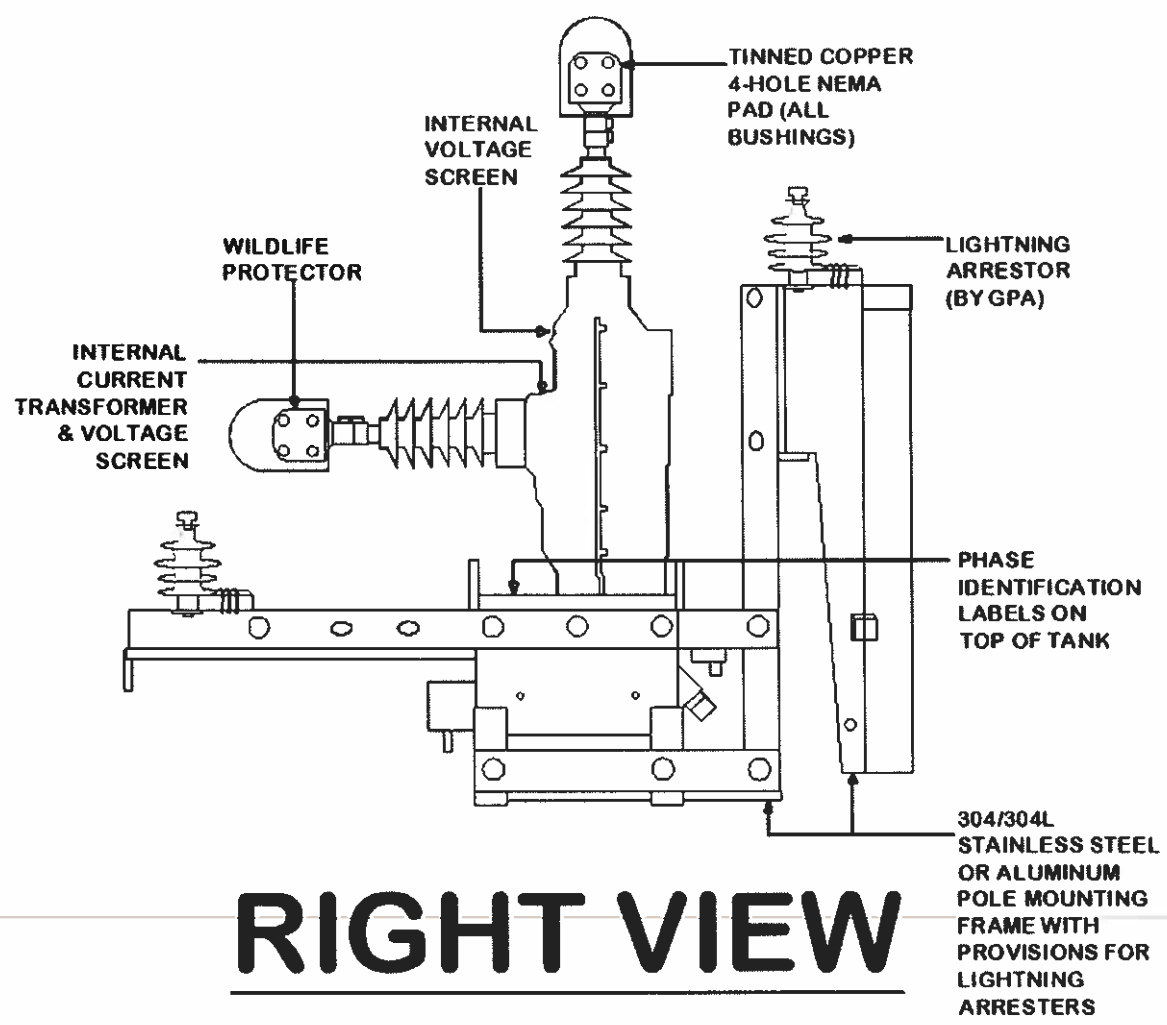
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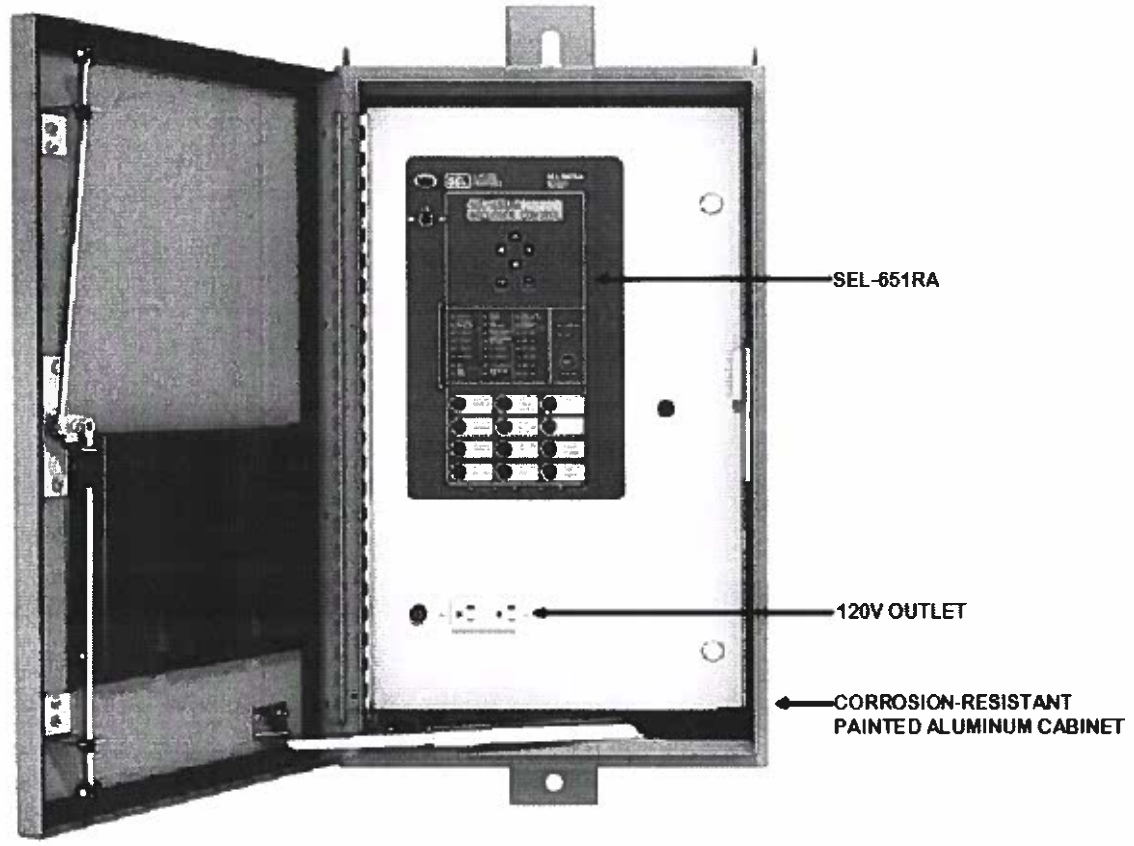
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Appendix D
RECLOSER CONTROL BOX UNIT



CONTROL UNIT

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