Request for Quotation

Date: 02/03/2025

Quotation Number: 8561

Specification/Quotation Documents For: 15KV & 69KV BREAKERS

RFQ Due Date: 02/17/2025 @ 02:00 pm

To avoid any delay, we encourage you to send responses ahead of the deadline. Responses will not be opened until the stated date and time.

Section 1 – Invitation to Bidders

Sealed bids will be received by BrightRidge until due date and time, then bids will be opened and publicly read. Bidders may participate in the public bid reading by contacting BrightRidge Purchasing at least two hours prior to the bid opening time stated on the specific bid. Bidders making this request will receive a conference call number and a participant code. BrightRidge Purchasing contact information: purchasing@brightridge.com or call 423-952-5161.

All bids must be delivered at the vendor's sole risk as shown in this request for quotation as per Section 2 Instructions to Bidders. BrightRidge is not obligated to accept quotations received after the date and time stated.

Exceptions, if any, will be considered in the quotation evaluation in determining the successful vendor. Vendor must provide supporting documentation with its quotation for any exceptions.

BrightRidge reserves the right to reject any or all quotations, to reject any bid that contains prices for individual items or services that are inconsistent or unrealistic when compared to other prices in the same or other bids, to waive any and all informalities and/or irregularities in the quotation, to negotiate and/or renegotiate with any vendor the terms of its quotation, and to accept any quotation which in its opinion may be in the best interest of BrightRidge. This Request does not commit BrightRidge to pay any costs incurred in the preparation of a proposal or to procure or to contract for service. BrightRidge reserves the sole discretion to withdraw this Request in its entirety at any time without prior notice.

Information provided in this Request is intended solely to assist the respondent in preparing a Quotation. To the best of BrightRidge's knowledge, the information provided is accurate, however, there is no warranty expressed or implied.

Quotations may be held by BrightRidge for a period not to exceed sixty (60) days from the due date of the quotations for the purpose of evaluating the quotations or investigating the qualifications of the vendors, prior to awarding of the order. All quotations shall remain effective for at least sixty (60) days after the due date.

Each vendor's quotation shall constitute an offer to sell the goods or services sought by this Request for Quotation. The award shall be made by execution of a contract mutually agreed upon by both parties.

BrightRidge is a trade name of the Johnson City Energy Authority.

Questions about the integrity or fairness of the sealed bid process contact:
Purchasing at 423-952-5161 or email purchasing@brightridge.com

Section 2 – Instructions to Bidders

Each Bidder shall carefully examine all specifications, drawings, and other contract documents to familiarize themselves with all the requirements, terms and conditions thereof. Any information relating to the work furnished by the Owner or others, or failure to make these examinations shall in no way relieve any Bidder from the responsibility of fulfilling all the terms of the contract, if awarded a contract.

No payment will be made for items not set up in the quotation, unless otherwise provided by contract amendment. All Bidders are cautioned that they should include in the prices quoted for the various bid items all necessary allowances for the performance of all work required for the satisfactory completion of the project.

REQUIREMENTS FOR A DIGITAL PROPOSAL/BID SUBMISSION

- **Bids should be clearly identified as:**
  Bid Enclosed and Your Company Name
  BrightRidge Quotation Number: 8561
  Name of the Request: 15KV & 69KV BREAKERS
  Due: 02/17/2025 at 2PM EST

- Send an email with an attached PDF of the digital bid including all required documents listed below to: **SEALEDBIDS@BRIGHTRIDGE.COM.** BrightRidge quotation number should be listed in the email subject line. Documents may be combined and sent as one PDF and cannot exceed 50MB in size. An automatic delivery receipt is sent indicating that the bid email has been delivered to sealedbids@brightridge.com

- Digital Proposal/Bids (hereafter called bids) received after the stated due date and time will be disqualified. BrightRidge will not open the bid submission email or any attachment until the due date and time stated for this sealed bid, this is to maintain the integrity of the sealed bid process

- Send a **SEPARATE EMAIL**, indicating that you have submitted a digital bid also include quotation number in the subject to: **PURCHASING@BRIGHTRIDGE.COM.** **DO NOT ATTACH A COPY OF YOUR BID TO THIS EMAIL!**

- No fax or physically delivered sealed bids will be accepted. **Bids must be digital.** Bidders from small & minority owned businesses needing to make alternative arrangements for physical delivery may call purchasing at 423-952-5161 or 423-952-5000.

Note:
Any bidder that submits a bid to BrightRidge of at least $250,000 or more that provides services, supplies, information technology or construction must certify that it is not currently engaged in, and will not for the duration of this Agreement engage in, a boycott of Israel as defined by Tenn. Code Ann. §12-4-119.

CHECKLIST FOR REQUIRED PAGES TO INCLUDE FROM BRIGHTRIDGE BID PACKAGE

NOTE: FAILURE TO SUBMIT THESE PAGES WILL RESULT IN DISQUALIFICATION OF BID

- **BrightRidge Request for Quotation Form**
- **Quote must be in same order and unit of measurement requested or bid may be disqualified**
- **Section 3-Quotation Information Form**
- **Specification Exception Form**
- **No Bid Questionnaire – If applicable**
- **Business and Taxpayer Identification or W9 form – for NEW vendors**

Contract
BrightRidge reserves the right to accept or reject any or all bids or portions thereof. Vendors may bid multiple options, unless otherwise stated.

Vendors must complete the BrightRidge Request for Quotation Form, if applicable and included in the request for quotation. As a backup, a vendor may include their company quote form, however, items must be quoted in the same order and in the unit of measure requested on the BrightRidge Request for Quotation form, a no-bid line needs to be included also in the order of our request if not bidding on an item.

Delivery
The price bid will be FOB Johnson City, Tennessee, at the location specified below. The bid price shown will be the full charge, including all applicable taxes, surcharges and other incidental fees, shipping charges included.

Delivery Site:
BrightRidge
Shipping/Receiving Entrance
2610 Boones Creek Rd
Johnson City, TN 37615

Invoicing
Unless otherwise stated, submit invoices upon delivery or pickup to ap@brightridge.com. The invoice must include an itemization of all items, supplies, repairs, or labor furnished, including unit list price, net price, extensions, and total amount due.

Payment
Unless otherwise stated, payment will be made within thirty (30) days of the completion of delivery of all items or services in acceptable condition to BrightRidge and receipt of invoice, whichever is later.

Taxes and Fees
BrightRidge is exempt from all Sales and Federal Excise Taxes please quote less these taxes.

BrightRidge is not responsible for financial or legal obligations of the bidders that may include bond premiums, fees, insurance, licenses, permits, taxes, tariffs, or other costs of compliance, unless agreed to in writing by BrightRidge. Taxes may include federal, state, or local taxes or levies. Particular attention should be given to bids that provide construction, installation, and maintenance services that utilize the materials and supplies purchased by BrightRidge. BrightRidge does not pay Tennessee sales and use tax when materials, supplies, and equipment are purchased. If the Bidder wants information about the value of the items that will be used, contact BrightRidge Purchasing. Make a note of Tennessee Code Annotated 67-6-209 section (b) and (e).

If the Bidder wishes to recoup obligations they owe as a result of work performed for BrightRidge, the Bidder must include them in the quotation price. Otherwise, the Bidder should not expect additional payment from BrightRidge for these obligations.

Equal Employment Opportunity Clause
To the extent not exempt therefrom, the vendor/subcontractor designated herein agrees to in all respects comply with and abide by the provisions of Executive Order 11246, Section 503 of the Rehabilitation Act of 1973, and the Vietnam Era Veterans' Readjustment Assistance Act of 1974, each as amended, and applicable implementing Regulations, including the Equal Employment Opportunity Clause referred to at 41 C.F.R. § 60-1.4, 41 C.F.R. § 60-741.5, and 41 C.F.R. § 60-250.5, as well as those otherwise appearing at 41 C.F.R. § 60-1, et seq., 41 C.F.R. § 60-741.1, et seq., and 41 C.F.R. § 60-250.1, et seq., each as amended.

Section 3 – Quotation Information

The successful contractor agrees to indemnify, investigate, protect, defend, and save harmless BrightRidge, its officials, officers, agents, and employees from any and all third-party claims and losses accruing or resulting from bodily injury or damage to property caused by the successful contractor in performance of this contract.

The successful contractor also agrees to indemnify, investigate, protect, defend, and save harmless BrightRidge, its officials, officers, agents, and employees from any and all third-party claims and losses accruing or resulting from bodily injury or damage to property caused by the successful contractor's sub-contractors, suppliers, laborers, and any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies to the successful contractor in connection with the performance of this contact.

If the successful contractor supplies products it manufactures (in whole or in part), the successful contractor agrees to indemnify BrightRidge, its officials, officers, agents, and employees from any and all third-party claims and losses accruing or resulting from bodily injury or damage to property caused by the failure of such products.

If the successful contractor only supplies products manufactured by others, the successful contractor is not obligated to indemnify BrightRidge for a failure of any such products manufactured by others. If the successful contractor only supplies products manufactured by others, the successful contractor agrees to cooperate with BrightRidge and take all reasonable steps to assist BrightRidge in making claims against any such product's manufacturer for any such product's failure.

In any case, the foregoing provisions concerning indemnification shall not be construed to indemnify BrightRidge from damage arising out of bodily injury to persons or damage to property caused by or resulting from the sole negligence of BrightRidge or its employees. This indemnification shall survive the expiration or early termination of this contract.

The undersigned acknowledges: That he/she is an authorized agent of the vendor submitting this quotation. The receipt of the following addenda (if any). The provision of the indemnification agreement.

Company Name:

_____

Company Address:

_____

Taxpayer ID: _____

Telephone Number: _____ **Mobile Number:** _____

E-mail: _____ **Fax Number:** _____

Primary Point of Contact: _____

Authorized Signature: _____

Date of Signature: _____**Title:** _____

Printed or Typed Name: _____

FAILURE TO SUBMIT THIS COMPLETED FORM WITH YOUR BID SUBMISSION MAY RESULT IN YOUR BID BEING REJECTED AS UNRESPONSIVE.

BrightRidge
Specifications Exception Form

In the interest of fairness and sound business practice, it is mandatory that you state any exceptions taken by you to our specifications.

It should not be the responsibility of BrightRidge to ferret out information concerning the materials which you intend to furnish.

If your bid/quotation does not meet all of our specifications, you must so state in the space provided below.

Bids on equipment, vehicles, supplies, services, and materials not meeting specifications may be considered by BrightRidge, however, all deviations must be listed below.

I do meet specifications.

Signature: _____

I do not meet specifications. *Exceptions are in the space provided.*

Signature: _____

FAILURE TO SUBMIT THIS COMPLETED FORM WITH YOUR BID SUBMISSION MAY RESULT IN YOUR BID BEING REJECTED AS UNRESPONSIVE.

Exceptions (please list below and specify exceptions)

No Bid Questionnaire

BrightRidge
Attn: Purchasing
2600 Boones Creek Rd
Johnson City, TN 37615

Quotation Number: 8561

If you choose not to bid, please complete the questionnaire below and return it with your response by the bid opening date. Your assistance in helping us to analyze no bid rationale is very much appreciated.

For the following reason(s) we are submitting a no bid:

_____ Item not supplied by our company.

_____ Bid specifications (e.g. too restricted, not clear, etc.) Please explain.
_____

_____ Profit margin on municipal bids is too low.

_____ Past experience with BrightRidge (e.g. payment delay, bid process, administrative problems, etc.) Please explain. _____

_____ Insufficient time allowed to prepare and respond to bid request.

_____ Bid requirement ☐ Too Large or ☐ Too Small for our company.

_____ Priority of other business opportunities limit time/other resources available to deliver or perform according to bid specifications.

_____ Other reason(s). Please explain. _____

Company Name: _____

Address: _____

Telephone: _____ E-mail: _____

_____ _____
(Signature) (Printed/Typed Name)

Title: _____ Date: _____

BrightRidge
Business and Taxpayer Identification Information

This Business is operating as a:

☐ Individual/Sole Proprietor or Single Member LLC ☐ Partnership ☐ Trust/Estate

☐ C Corporation ☐ S Corporation

☐ Limited Liability Company
(Enter the tax classification (C=Corporation, S=S Corporation, P=Partnership) _____

☐ Other (please describe) _____

Licensed or otherwise authorize to business by the state of: _____

Taxpayer Identification Number: __ __ - __ __ __ __ __ __ __
Or
Social Security Number: __ __ __ - __ __ - __ __ __ __

Legal Name: (as shown on your income tax return)

_____

Doing Business as Name: (DBA)

_____

Address: _____

City, State, Zip: _____

Note:
If applicable, your bid may be rejected if you do not complete and submit this page and/or a W-9 with your bid. Checks in payment of obligations by BrightRidge will be made payable to your legally issued name unless you state a DBA. Federal Tax reporting, if required, will also be in your legal name.

REQUEST FOR QUOTATION

BrightRidge
2600 Boones Creek Rd.
Johnson City, TN 37615

Vendor	Quotation
50000	8561
Print Date	**Page**
02/03/2025	1

TO
BRIGHTRIDGE *** SEALED BID ***
PLEASE WRITE COMPANY NAME IN THIS AREA
2600 BOONES CREEK RD
JOHNSON CITY, TN 37615

SHIP TO
JOHNSON CITY ENERGY AUTHORITY
2610 BOONES CREEK ROAD
JOHNSON CITY, TN 37615
Phone: (423)952-5161
Fax: (423)952-5092

Phone:
Fax:

Response Due Date: 2:00 pm 2/17/2025

Requested Terms

Shipment Method	Shipment Terms	FOB	Payment Terms
Best Way	Pre-Paid and Included	DESTINATION	NET -30 DAYS

LN	ITEM	QUANTITY	UOM	DESCRIPTION	UNIT PRICE	DEL DT/LEAD TM
1	0	1.000	EA	69KV BREAKER FOR BUFFALO MOUNTAIN SUB		
2	0	6.000	EA	15KV BREAKERS FOR BUFFALO MTN SUBSTATION		

Vendor Terms

Shipment Method	Shipment Terms	FOB	Payment Terms

ALL PRICING MUST BE GOOD FOR 7 DAYS AFTER RECEIPT OF PURCHASE ORDER. VALID THRU DATES MUST BE ENTERED IF PRICING WILL ONLY BE HELD FOR A SPECIFIC PERIOD OF TIME.

NOTE TO AVOID DISQUALIFICATION OF YOUR QUOTATION
Vendors must use quotation provided, you may include your own form as back up: quote items in the same order as our form, BrightRidge form will be used for Processing Bid. QUOTES MUST BE IN THE SAME UNIT OF MEASUREMENT AS REQUESTED. Indicate manufacturer quoted. If not a listed manufacturer, pre-approval is required through our Engineering Department. Include estimated delivery date. Please note that your lead times may impact our selection process. Standard packaging needs to be indicated on quote. *Note our requested shipping terms are pre-paid and included, if different terms the estimated amount of shipping charges need to be included with quotation.

Valid Through Date:

Authorizing Signatures

RACHAEL MILLER
GENERAL ACCOUNTANT
(423)952-5161

BrightRidge

Engineering Department

Specifications for Quantity 6
15Kv Power Circuit Breakers

SECTION: REFERENCE STANDARDS

1.1 Quality Assurance

A. Comply with latest revision of the standard for all equipment, materials and labor, except when more rigid requirements are specified or are required by applicable codes.
B. Request clarification from Engineer before proceeding, should specified reference standards conflict with any sections of this document.

1.2 Schedule of Reference

A. Documents and/or Standards from the following agencies may be referenced in the sections of this document:

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
EEI	Edison Electric Institute
EPA	Environmental Protection Agency
ICEA	Insulated Cable Engineers' Association
IEEE	Institute of Electrical and Electronics Engineers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers' Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SSPC	Steel Structures Painting Council
RUS	Rural Utility Service
UL	Underwriters' Laboratories, Inc.

END OF SECTION

SECTION: GENERAL CONDITIONS

1.1 Standards for Materials

A. All materials shall be new. Used or salvaged materials shall not be considered unless specifically authorized by the Engineer/Architect.

1.2 Warranty

A. All material furnished by the Materialman, covered by the drawings and specifications and official modifications thereof, shall be warranted by the Materialman for a period of one year from the date of acceptance by the Owner. All necessary repairs required during this period due to defective workmanship or material shall be made promptly by the Materialman at his facilities or at the customer's site, whichever is best, without cost to the Owner, including all costs for transportation in both directions between the manufacturer's facilities and the delivery site, including Owners costs for removal and installation, at times convenient to the Owner.

B. After the beginning of the warranty period, the Materialman shall not be responsible for lubrication, filter servicing, adjusting of belts and other items normally requiring periodic adjustments, cleaning out strainers, and other normal maintenance operations, all of which shall be the Owner's responsibility.

C. The Engineer/Architect shall have the sole right to establish the beginning of the warranty period for all portions of the project, and if so stated in the Contract, the guarantee period shall not begin until a trial run has been completed with satisfactory operation for the period of time stated in the Contract.

1.3 Liquidated Damages

A. If so stated in the quote, the time of completion of the construction is of the essence of the contract and should the Materialman neglect, refuse, or fail to complete the work to be done under the contract within the time stated in the quote, after all extensions of time granted by the Owner have been added, then in that event the Owner shall have and is hereby given the right to deduct and retain out of such monies which may then be due, or which may become due and payable to the Materialman for the work to be done under this contract, the amount stated in the quote per calendar day for each and every day that the work is delayed in its completion beyond the specified time. The amount stated in the quote will be held by the Owner to pay Engineering, Architectural, and legal fees and other costs occasioned by the delay in completion of construction.

END OF SECTION

SECTION: SHOP DRAWINGS

1.1 Shop Drawings

A. Shop drawings shall include: fabrication, erection, layout, and setting drawings; material lists; manufacturer's catalog sheets and/or descriptive data for materials and equipment showing dimensions, performance characteristics, and capacities; wiring and control diagrams; electrical characteristics, and capacities; and other pertinent information as required to obtain approval of the items involved.
B. Drawings shall be presented in a clear and thorough manner.
C. Minimum sheet size: 8 ½" x 11"
D. Maximum sheet size: 22" x 34"

1.2 Product Data

A. Preparation:
   1. Clearly mark each copy to identify pertinent products or models.
   2. Show performance characteristics and capacities.
   3. Show dimensions and clearances required.
B. Manufacturer's standard schematic drawings and diagrams:
   1. Modify drawings and diagrams to delete information which is not applicable to the work.
   2. Supplement standard information to provide information specifically applicable to the work.

1.3 Materialman Responsibilities

A. Designate in the submittal schedules, the dates for submission and the dates that reviewed Shop Drawings and product data will be required to maintain delivery schedule.
B. Review Shop Drawings and Product Data prior to submission. Materialman shall allocate 10 business days (excluding holidays) in the product schedule for the Engineer's initial review. Additional time may be required for resubmission.
C. Determine and verify:
   1. Catalog numbers and similar data
   2. Conformance with specifications
D. Begin no fabrication or work which required submittals until return of submittals with satisfactory review.

1.4 Submission Requirements

A. Provide a submittal schedule indicating review dates and return dates required to maintain project schedule. Make submittals promptly in accordance with approved schedule.

B. Number of submittals required:

1. Shop Drawings: Submit one copy of electronic data files of all drawings prepared for the project. Electronic data files shall be either an AutoCAD Format (.DWG) or a .PDF format. Raster based scans (.TIF, .PCX, or .GIF) files of manual drawings are not acceptable.

2. Product Data: Submit one electronic copy of product data of all items for which product data is specified in other sections. Electronic data files shall be in a .PDF format.

3. Shop Drawings and Product Data can be provided on a CD-ROM or via e-mail. When submittal data is delivered via e-mail, it is the materialman's responsibility to verify receipt by the Engineer.

C. Submittals shall contain:

1. Transmit each submittal with transmittal letter or Engineer accepted form.

2. Revise and resubmit submittals as required, identify all changes made since previous submittal.

3. Submittal identification number. Submittals shall be numbered consecutively. Resubmittals shall use the same submittal number with an alphabetic suffix added.

4. The date of submission and the dates of any previous submissions.

5. The Owner's name, project title and number.

6. Contract Identification.

7. Identification of the project, with the specification section number.

8. Relation to adjacent or critical features of the work or materials.

9. Applicable standards, such as ASTM or Federal Specification numbers.

10. Identification of deviations from Contract Documents.

11. Identification of revisions on resubmittals.

12. A 3" x 3" blank space for Materialman and Engineer stamps.

1.5 Return for Submission

A. The Engineer will return for resubmission all shop drawings submitted without the above specified approval and certification which in the Engineer's opinion contain numerous discrepancies, have not been checked, or do not meet the requirements for submission.

1.6 Review of Submittals

A. The Engineer will review, mark and date all submitted shop drawings. One electronic set will be returned to the Materialman. When submittal date is returned via e-mail, it is the Engineer's responsibility to verify receipt by the Materialman.
B. Resubmit shop drawings are specified above, until satisfactory review has been obtained. Corrections and/or changes indicated on shop drawings by Engineer/Owner shall not be considered as an extra hour of work.
C. After satisfactory "Reviewed" or Furnish as Corrected" has been obtained for all shop drawings, a set of shop drawings marked "FOR CONSTRUCTION" shall be furnished to the Engineer in the format specified above. The "FOR CONSTRUCTION" drawings shall be provided within 21 days of receipt of drawings with a satisfactory review by Materialman.
D. Review of shop drawings by the Engineer will be general only, and such review will not relieve the Materialman of responsibility for accuracy of such shop drawings proper fitting, coordination, construction of work, and furnishing material required by the specifications but not indicated on shop drawings. Review of shop drawings shall not be construed as approving departure from the specifications.

1.7 Engineer Duties

A. Review submittals with reasonable promptness and in accordance with schedule.
B. Initial or signature, and indicate requirements for resubmittal, or satisfactory review of submittal.
C. Return submittals to Materialman for distribution or resubmission.

END OF SECTION

SECTION: PROJECT RECORD DOCUMENTS

1.1 Submittals

A. Comply with pertinent provisions of the Shop Drawings Section.
B. Prior to submitting request for final payment, submit the final Project Record Documents to Engineer for approval.

1.2 Materialman Responsibilities

A. The Materialman shall provide final "As-Built" record drawings of the work with all revisions in incorporated.
B. The Materialman shall provide factory test results, as applicable, for all material furnished.
C. The Materialman shall provide complete operation and maintenance manuals for all equipment furnished.

1.3 Final Drawings

A. At completion of project, the Materialman shall incorporate all revisions into the shop drawings to provide a complete set of final drawings. The drawings shall be marked as "Final-As Constructed".
B. One copy of electronic data files of all drawings prepared for the project. Format shall be AutoCAD 2000 or later, vector based .DWG files. Raster based scans (e.g., .TIF, .PCX, or .GIF) files of manual drawings are not acceptable. Media shall be CD-ROM or via e-mail.

1.4 Factory Test Results

A. The Materialman shall provide, as a minimum, results for all routine or production tests required by the industry standards referenced in the technical sections.
B. The Materialman shall also provide results for any non-routine tests specified in the technical sections.
C. When required in the technical sections, required test results shall be forwarded to the Engineer prior to shipping.
D. Engineer shall have two weeks to review factory test results before shipping.

1.5 Operation and Maintenance Manuals

A. The Materialman shall provide three complete sets of Operations, Maintenance and Instruction Manuals covering all equipment furnished for the project.
B. Contents of Manuals:
    1. Table of Contents and index tabs.
    2. Description of the equipment.
    3. Operating Instructions.
    4. Installation instructions including rigging and lifting details.
    5. Maintenance instructions.
    6. Instruction manuals for installation, operation and maintenance of each accessory device, including oil filling procedures.
    7. Assembly drawings.
    8. Parts lists.
    9. List of recommended spare parts.
    10. List of maintenance tools furnished with the equipment.
    11. Nameplate information and shop order numbers for each item of equipment and component part.
    12. Final As-Constructed shop drawings.
    13. Photographs (if required in specifications).
    14. Certified factory test results.
C. Format
    1. All manuals shall be bound in a binder of suitable size (maximum 2”) for the material to be inserted.
    2. Binders shall be white in color with clear jacket for the insertion of printed cover and edge identification sheets.
    3. Instruction manuals for microprocessor based relays shall be provided in the manufacturers’ original binding or in a separate binder produced by the Materialman with dividers identical to the relay manufacturers’ manual.
    4. All information bound shall be 8 ½” x 11” or accordion folded to this size.
    5. Page dividers with plastic reinforced holes and tabs shall be used to organize Operations and Maintenance Manuals.
    6. Binder cover and edge inserts shall contain Owner’s name, project title, date and subject matter of the manual.
D. Organization
    1. Table of contents shall list all information contained.
    2. Contact information for all major equipment suppliers, Materialman, and subcontractors.
    3. Organize manual by equipment item. Contents as specified above.

1.6 Final Submittal

A. All Record Documents, including final drawings and Operation, Maintenance and Instruction Manuals shall be submitted to Engineer prior to submitting final payment request.

1.7 Changes Subsequent To Acceptance

A. The Materialman has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION

SECTION: POWER CIRCUIT BREAKER

1.1 Reference Standards

A. Published Specifications, standards, tests, or recommended methods of trades, industry, or governmental organizations apply to work in this section where sited Reference Standards and in the listing below.
   1. ANSI/IEEE C37.04-Standard Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
   2. ANSI 37.06-AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis-Preferred Ratings and Related Required Capabilities.
   3. ANSI/IEEE C37.09-Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
   4. ANSI/IEEE C37.10-Standard Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
   5. ANSI/IEEE C37.11-Standard Requirements for Electrical Control for AC High-Voltage Circuit Breaker Rated on a Symmetrical Current Basis.
   6. ANSI/IEEE C57.13- Standard Requirements for Instrument Transformers.
   7. ANSI/IEEE C57.19.01-Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings.
   8. NEMA SG4-2000 (R2005)-Alternating Current High-Voltage Circuit Breakers.

1.2 Proposal Requirements

A. Certification of suitability of proposed materials for application on power system with the service conditions listed in the Data Sheet.
B. Descriptive literature to be furnished with proposal shall include but not limited to:
   1. Breaker Ratings:
      1. Rated maximum voltage
      2. Rated short circuit current
      3. Maximum symmetrical interrupting capability
      4. Maximum asymmetrical interrupting capability
      5. Percent of rating for specified reclosing duty cycle
   2. Outline dimension drawings with weights and anchor bolt layout.
   3. Power supply requirements – as applicable
      a. Spring Operator: Trip/close and motor start/run currents
      b. Magnetic Operator: Steady State and Charging currents
   4. Current transformer data
   5. Special tool requirements
   6. Time to charge operator mechanisms
   7. Annual Maintenance Requirements

1.3 Submittals

A. Shop drawings shall be submitted for approval in accordance with the Shop Drawing Section.
B. Submittals shall consist of, but not limited to, the following:
    1. Outline Dimension Drawing with Weights.
    2. Foundation Requirements:
        a. Foundation loading and moment reactions for operations, wind, and seismic loading.
        b. Controlling load condition.
    3. Terminal Displacement/Deflection Information:
        a. Wind
        b. Seismic
    4. Seismic Qualification Report (not required for 34.5 Kv class or below)
    5. Anchor Bolt specifications (material) and layout
    6. Schematics
    7. Power Supply requirements-as applicable
        a. Spring Operator: Trip/close and motor start/run currents
        b. Magnetic Operator: Steady State and Charging currents
    8. Wiring Connection Diagrams
    9. Current Transformer Data
    10. Bushing Data/Drawings
    11. Nameplate and Engraving Drawing
    12. Installation Instructions
    13. Operating Instructions
    14. Final Certified Test Reports
C. Final Drawings, Manuals, and Test Reports shall be provided prior to shipment in accordance with the Project Record Documents Section.

1.4 Service Conditions

A. Service conditions are shown on the Data Sheet Section.

1.5 Warranty

A. All materials and equipment supplied under this specification shall be warranted as outlined in the General Conditions.

1.6 Manufacturers

A. Power circuit breakers approved for this project are shown on the Data Sheet Section.

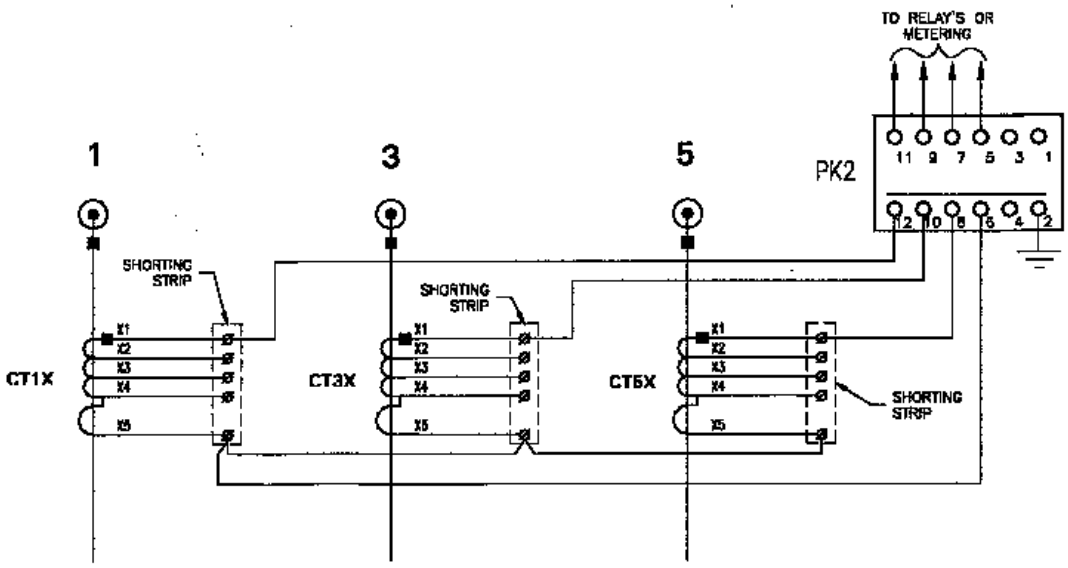
1.7 Materials

A. Power circuit breaker equipment ratings are shown on the Data Sheet Section.
B. Operator Mechanism:
    1. See the Data Sheet Section for specific Operator Mechanism requirements.
    2. Spring Breaker Operator: Circuit breaker utilizing a motor charged spring operator shall provide and open/close/open cycle without recharging of the spring mechanism. Spring charged stored energy mechanism shall be normally charged by a universal motor with provisions for manual handle for manual emergency closing and testing. The motor shall recharge spring in 10 seconds or less.
    3. Magnetic Actuator Breaker Operator: Circuit breaker utilizing a magnetic actuator shall incorporate a stored energy process to provide an open/close/open cycle without electric power supply to the operator. The stored energy equipment shall recharge in 10 seconds or less.
C. Gas Monitoring System (where applicable):
        1. Gas Pressure Gauge: Gauge shall be scaled in US units (pounds per square inch-PSI)
        2. Piping shall allow isolation of the interrupters to allow adjustment of low pressure alarm and lockout switches.
        3. Gas system shall allow refilling of the interrupters in the field.
D. Controls:
    1. Temperature compensated gas density switch with separate low pressure alarm, trip, and lockout contacts. Label/nameplate shall be affixed inside of cabinet indicating the alarm, trip, and lockout gas pressure/settings.
    2. Alarm contacts shall be isolated from “C” provided for the Owner’s use as indicated below:
        a. Manufacturer’s standard alarm points.
        b. Loss of Power to spring Charging Motor or Magnetic Actuator.
        c. Loss of DC Power Supply
        d. Low Gas Alarm and Low Gas Lockout.
    3. Control circuits shall contain provisions for Protective Relay Trip and Block Close interlocks from external devices.
    4. Control switch (also see the Data Sheet Section)
    5. Remote/local control selector/transfer switch (also see the Data Sheet Section)
    6. Position-Indicating Lamps (one red, one green) shall be mounted inside control cabinet, GE LED Type ET 16.

7. Minimum of 8 NO and 8 NC auxiliary switch contacts in addition to those required for operation for Owner's use.

E. Control Cabinet:
   1. Control Cabinet condensation heater with thermostat or positive temperature coefficient heaters.
   2. 120 VAC, GFI Receptacle.
   3. Cabinet interior light (120 VAC), suitable for application and protected from accidental breakage, automatically controlled by cabinet door.
   4. Terminal Blocks for connection of Owner's cable shall be suitable for un-insulated ring terminals and No. 10AWG conductor.
   5. Controls shall be mounted in NEMA 3R weatherproof enclosure. All controls shall be accessible standing at ground level.

F. Current Transformers:
   1. All relay class bushing current transformers (BCT) shall be 5 lead, multi-ratio type with fully distributed windings with a minimum continuous current rating factor of 2.0 Ratio, Accuracy Class and location shall be as indicated on the Data Sheet Section.
   2. Bushing Current Transformer Wiring:
      a. All bushing current transformer leads shall be pre-wired to shorting type terminal blocks in the main control cabinet. From these terminal blocks, leads will be prewired to GE 6-pole PK-2 test blocks. The ratio and connection (wye or delta) will be formed at the shorting type terminal blocks. Therefore, for a three-phase transformer, one 6-pole PK-2 block will be required for each set of three-phase BCTs. A 4-pole PK-2 test block should be used for BCT circuit that is not a three-phase set.
      b. Incoming BCT wiring to the PK-2 test blocks shall be terminated on the bottom of the block and the outgoing (relay/meter) wiring shall be terminated on the top of the block. For three-phase BCT sets, the H1 or X1 polarity lead shall be on left as viewed from the front of the panel.
      c. Wiring from PK-2 blocks to terminal blocks for connection to external circuits shall be provided.
      d. The shorting type terminal blocks shall be marked to identify CT ratio connections.
      e. All secondary leads of the current transformers shall have a 150°C temperature rating and be #12 AWG, minimum.
      f. An example showing the specified three-phase BCT circuit is shown below.



g. Each CT shall have a unique alphanumerical designation on the transformer's main nameplate.
h. Labeling adjacent to the shorting type terminal blocks shall identify the CT using the transformer's main nameplate designation.
i. Phenolic nameplates adjacent to the PK-2 block shall identify the connected CT(s) using the transformer's main nameplate designations.

G. Main contact Position Indicator
H. Closing circuit shall contain a manually-reset closing circuit cut-out Switch (69) opened by breaker manual trip mechanism.
I. GE PK-2 test blocks, 4-pole and/or 6-pole. Quantity and wiring for operation as shown on attached drawings (also see the Data Sheet Section).

1.8 Accessories

A. Standard NEMA Accessories, as appropriate for the device.
B. One travel recorder mounting device, if appropriate for the device.
C. One gauge for checking circuit breaker contact wear, if appropriate for the device.
D. Field kit for installation of insulating gas, if appropriate for the device.

E. Phenolic Nameplates, black with white core letters, shall be provided for all control and bypass switches and indicating lights and any major items of equipment mounted in the relay and control cabinets. Proposed engraving shall be submitted for approval.

1.9 Protective Relaying and Metering

A. Protective Relaying and Metering information is shown in the Data Sheet Section.

1.10 Fabrication

A. Operating mechanism shall have the following (when appropriate):
    1. Means to prevent overcharging of spring.
    2. Means to prevent insufficiently charged spring from attempting to close breaker.
    3. Mechanical indication that spring is charged, not fully charged or discharged.
B. All Equipment control and power leads shall be prewired to terminal blocks for external connection. Terminal blocks shall be marked to identify leads.
C. All control wiring shall use un-insulated ring terminals.
D. Wiring shall be clearly labeled, without splices or tee connections, and bundled as appropriate for usage.
E. When separate Control and Operator Cabinets are required by manufacturers' design, all cabling between cabinets shall be suitably protected by rigid or flex conduit with suitable fittings.
F. Supply circuit for cabinet heaters shall be separately fused (not connected to control fuses). Strip heaters shall be located such that residue from the heater will not fall onto breaker electrical, mechanical, or operating parts. Heater shall not be located in a manner that will damage breaker wiring, relays, or other breaker materials. Heater shield shall not be painted or otherwise coated with any material that will give off fumes or residue when heated. Heater wiring shall utilize high temperature conductor insulation.
G. All control cabinets shall be weatherproof with hinged access door complete with handle type latching mechanism with provision for locking with a padlock in a closed position. Provisions shall be included for maintaining the door in a fully opened position for maintenance within the control cabinet.
H. Relay and control equipment shall be mounted on hinged swing out panel mounted inside control cabinet.
I. Relay/Control and Bushing Current Transformer Wiring shall be in accordance with the attached drawings.
J. Adjustable frame with extensions as required to place bottom of high voltage bushings a minimum of 8'-6" above breaker foundation and live parts a minimum elevation above breaker foundation as listed below:

    15.5 Kv 9'-0"
    25.0 Kv 10'-0"

34.5 Kv	10’-0”
46.0 Kv	10’-0”
69.0 Kv	11’-0”
115.0 Kv	12’-0”
138.0 Kv	13’-0”
161.0 Kv	14’-0”

K. All surfaces of breaker frames, tanks, operating mechanisms, and other parts exposed to possible corrosion shall be weatherproofed and designed to prevent accumulation of moisture. Those surfaces that require painting shall be chemically cleaned and given a minimum of two coats of rust-inhibitive paint a minimum of three mils in total thickness. Coating shall meet ANSI B117 Salt Spray requirements.

L. Anchoring dimensions need to be as shown in the attached drawing.

1.11 Power Circuit Breaker Testing

A. Required Testing: Tests designated as routine in the latest revision of ANSI/IEEE C37.09.

B. Certified copies of the test data shall be furnished and approved by the Engineer before the breaker is shipped.

1. Test data shall include but not limited to the following:
    a. Data Sheets from all specified tests.
    b. Data Sheets for all other routine tests complete by the Materialman, but not specified by the Engineer.

END OF SECTION

SECTION: DATA SHEET

15kV Power Circuit Breaker

Bid shall include the fabrication and delivery of power circuit breaker(s).

1.1 Service Conditions

A. The power circuit breaker(s) will be installed in a 69:13kV substation for distribution feeder protection.
B. Elevation: Less than 3,000 feet about main sea level.
C. Ambient Temperature Range: -25°C to 50°C
D. System Voltage:
   Nominal: 12,470 Volts 60 Hz
   Operational: 13,090 Volts 60 Hz
E. System Grounding:
   15Kv Bus: Solid
F. System Fault Current Levels:
   15kV Bus: 13,750 3-Phase/Amps X/
   R=22.5 15,500 Single-Phase/G Amps X/
G. Duty Cycle: R=23.8
   a. Open-0.3 sec, CO-15 sec, CO-45 sec, CO-lockout
H. Seismic Requirements:
   1. The power circuit breaker, when installed with manufacturer's supplied mounting frame and specified anchor bolts, and Owner supplied flexible jumper connections to circuit breaker terminals shall be qualified according to IEEE 693-2005, "Recommended Practice for Seismic Design of Substations" (Annex C) and meet the requirements below:
      a. Seismic Qualification Level: Moderate
      b. PGA = 0.24g
      c. The circuit breaker shall be qualified by the following method based on voltage class:
         1) 169 Kv and above — By Dynamic Analysis or time history and Sine beat shake-table testing
         2) 121 Kv to less than 169 Kv — By Dynamic Analysis
         3) 35 Kv to less than 121 Kv — By Static coefficient method
         4) Less than 35Kv — Inherently Qualified
      d. Importance Factor (Earthquake) (IFE) =1.25
         Anchorage =2.0
      e. Site Class: D
      f. Seismic coefficients:
         SM1= 0.26
         SMS = 0.40

SMS = 0.59
SD1 = 0.17

1.2 Manufacturers

A. Power circuit breakers by the following manufacturers are approved for bidding:

1. ABB
2. Alstom
3. Siemens

1.3 Materials

A. Power circuit breaker equipment ratings:
   1. Breaker Design: Dead Tank
   2. Interrupting Medium: Vacuum
   3. Maximum System Voltage: 15.5Kv
   4. Continuous Current Rating: 1200 Amperes
   5. Interrupting Rating: 25 Ka
   6. Maximum Operation Time: 5 Cycles
   7. Basic Impulse Level: 110 Kv
   8. Ratio, Accuracy class and location shall be as follows (X-position is adjacent to contact, Y-position (or Z-position, if equipped) is adjacent to bushing terminal):

	Ratio	Accuracy Class
Bushings 1,3 and 5:		
X Position	1200:5	C400
Bushings 2, 4 and 6:		
X Position	1200:5	C400

   9. Dual trip coils are required.
   10. Auxiliary Equipment Ratings:

       Trip Voltage: 125 Volt DC

       Close Voltage: 125 Volt DC

       Motor Voltage: 240 Volt, AC, 3 wire single phase

       Heater Voltage: 240 Volt, AC, 3 wire single phase

   11. Operating Mechanism: Spring Motor
   12. Stored energy shall provide an open/close/open cycle without recharging of the spring mechanism assembly or control assembly.

13. Bushings shall be porcelain, ANSI No. 70, Light Gray, extended creep at the appropriate BIL level for the voltage class. Bushings shall be equipped with stud terminals and NEMA 4-hole tin-plated pads. Bushings supplied for 15 Kv class shall provide a minimum of 10 inches clearance from “live parts” to the metal enclosure top.
14. Color: ANSI No. 70, Light Gray.

1.4 Control Switch Equipment

A. None

1.5 Protective Relaying and Metering

A. One microprocessor-based 3 phase and ground time and instantaneous over current relay with reclosing. SEL Type 351S, Catalog No. 0351S6X3E4F54X1.
B. Test Switch Type FT-19R. 30 pole potential test switches. ABB catalog No. FR3G001001001C.
C. GE PK-2 current test blocks, 4-pole and/or 6-pole. Type and quantity as required for operation as shown in the attached drawings.

END OF SECTION

POWER CIRCUIT BREAKER

ELEMETARY DIAGRAM

15 kV FEEDER PROTECTION

125VDC SUPPLY

(+)

(-)

TS2

A05 Z18 A03

OUT103 79 RECLOSE

CLOSE (PB)

OUT102 SCADA CLOSE

351S

A06 Z17 A04

B C D

TS2

86

ELECTRONIC CONTROLLER

CLOSE

Z16 A01

TRIP (PB)

OUT101 TRIP

Z15 A02

E F

TS2

86

ELECTRONIC CONTROLLER

OPEN

TS1

A

TS1

B

52 a

52 b

SPARE

SCADA TRIP

SCADA CLOSE

27AC AC LOSS

C D E F G H I J

TS1

Z25 A18 A20 A22 A24 A26 A28

POWER SUPPLY

IN101 52a

IN102 52b

IN103 AC LOSS

IN104 SPARE

IN105 SC TRP

IN106 SC CL

Z27 Z26 A17 A19 A21 A23 A25 A27

52 b

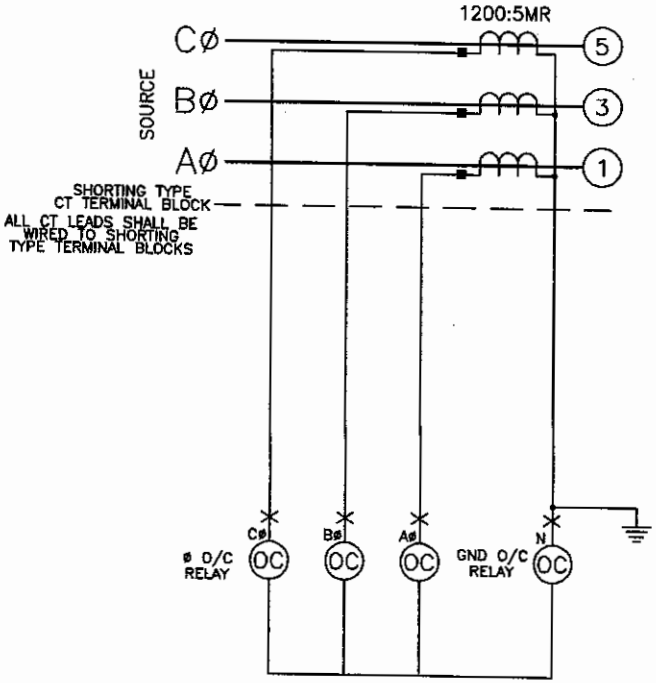
52 a

Z22 Z20

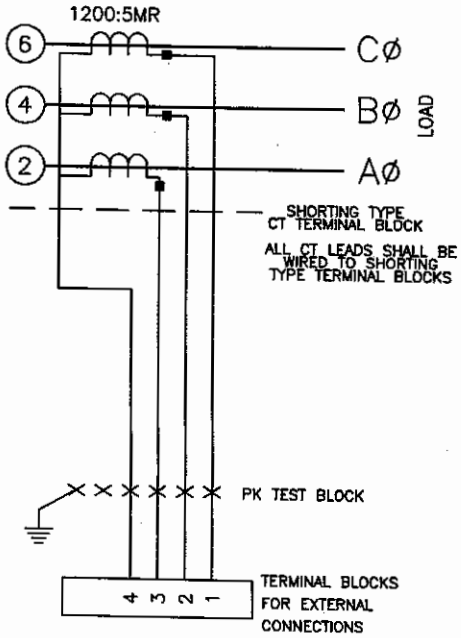
G 351S R

LED LED

Z21 Z19



MECH



LEGEND

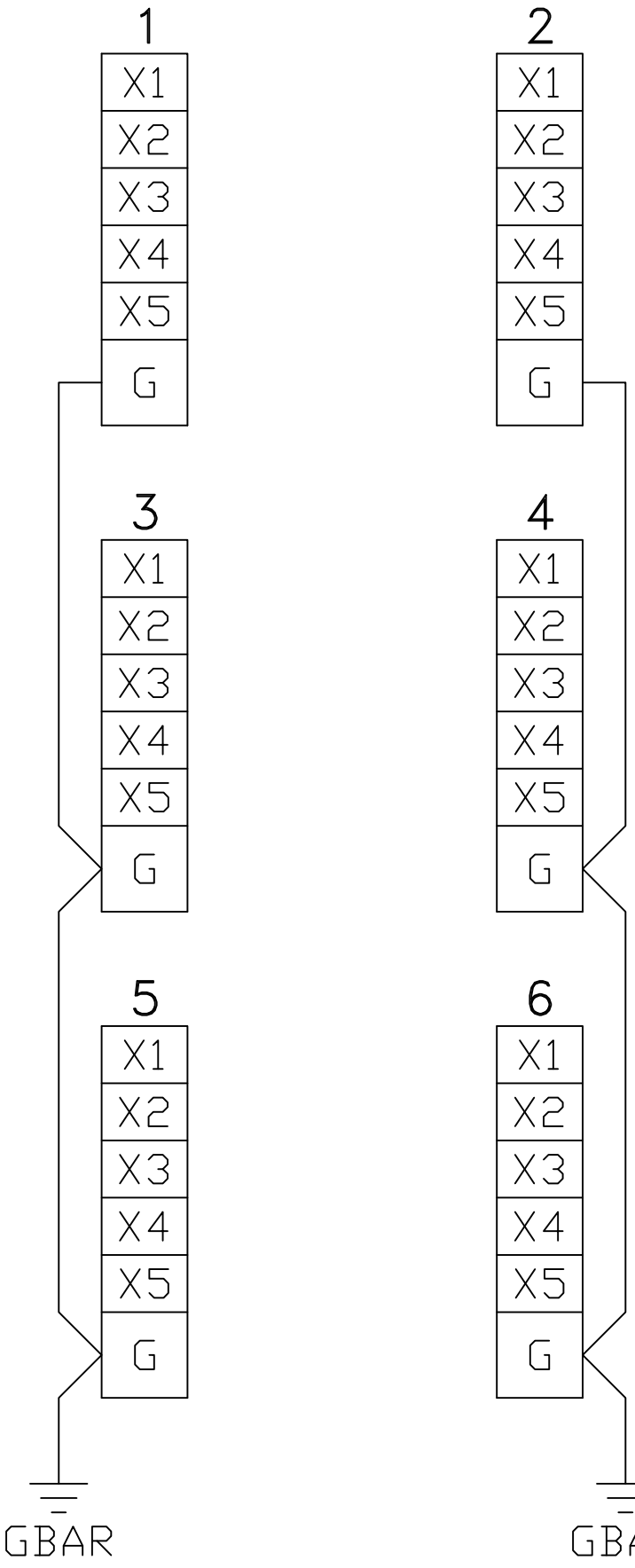
OC OVERCURRENT RELAY
X TEST BLOCK WITH COVER, G.E. PK-2

DRAWN	RAY		JOB NO.	81247
CHECKED	JNC		DATE	MAY2012
APPROVED	APPRD		SCALE	N.T.S.

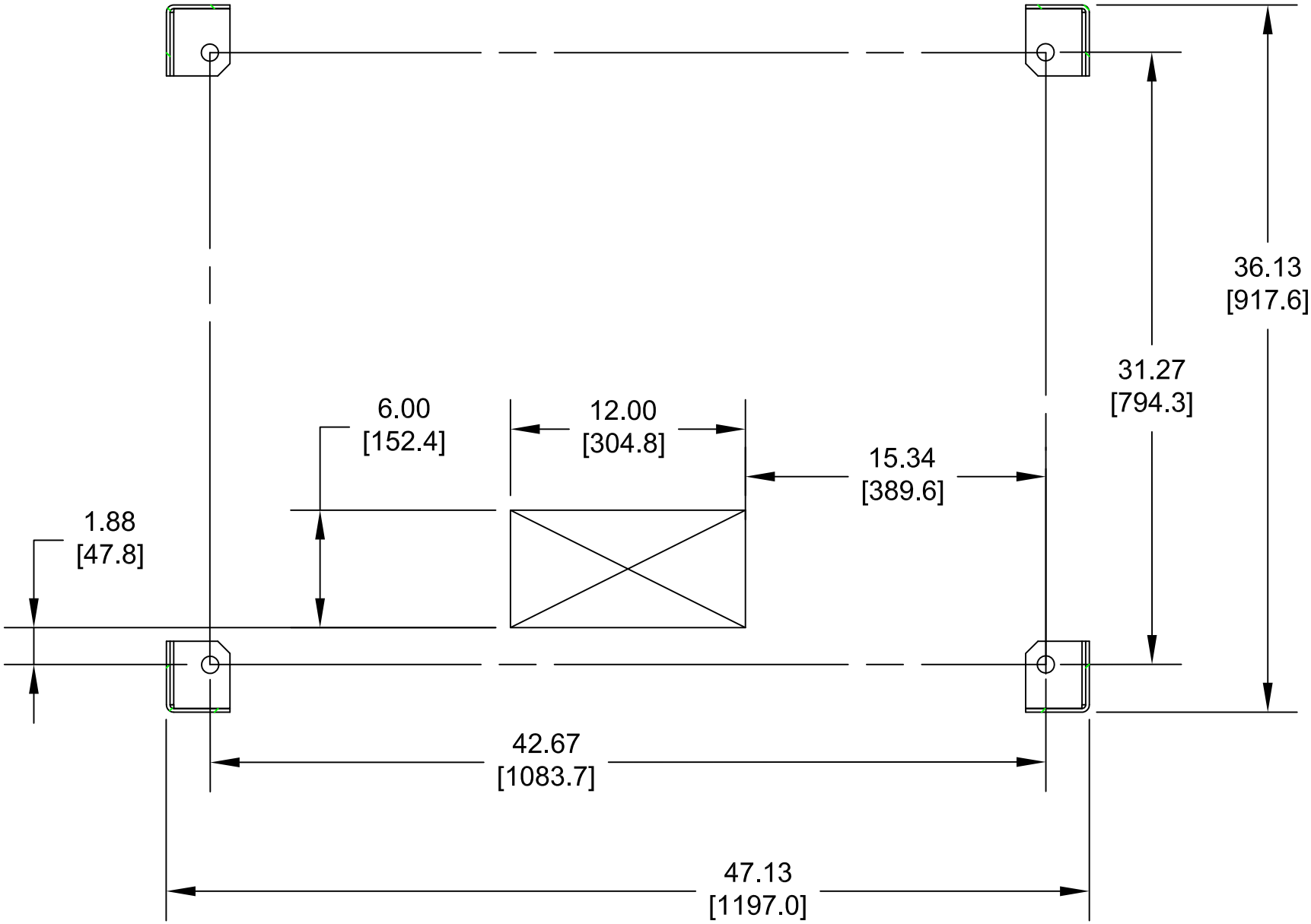
POWER CIRCUIT BREAKER

RELAY / CURRENT CIRCUIT

DRAWING NO



Shorting Type CT Terminal Block



FRONT VIEW

Foundation Anchor Bolt Plan

BrightRidge

Engineering Department

Specifications for Quantity 1-69Kv Power Circuit Breaker

SECTION: REFERENCE STANDARDS

1.1 Quality Assurance

A. Comply with latest revision of the standard for all equipment, materials and labor, except when more rigid requirements are specified or are required by applicable codes.
B. Request clarification from Engineer before proceeding, should specified reference standards conflict with any sections of this document.

1.2 Schedule of Reference

A. Documents and/or Standards from the following agencies may be referenced in the sections of this document:

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
EEI	Edison Electric Institute
EPA	Environmental Protection Agency
ICEA	Insulated Cable Engineers' Association
IEEE	Institute of Electrical and Electronics Engineers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers' Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SSPC	Steel Structures Painting Council
RUS	Rural Utility Service
UL	Underwriters' Laboratories, Inc.

END OF SECTION

SECTION: GENERAL CONDITIONS

1.1 Standards for Materials

A. All materials shall be new. Used or salvaged materials shall not be considered unless specifically authorized by the Engineer/Architect.

1.2 Warranty

A. All material furnished by the Materialman, covered by the drawings and specifications and official modifications thereof, shall be warranted by the Materialman for a period of one year from the date of acceptance by the Owner. All necessary repairs required during this period due to defective workmanship or material shall be made promptly by the Materialman at his facilities or at the customer's site, whichever is best, without cost to the Owner, including all costs for transportation in both directions between the manufacturer's facilities and the delivery site, including Owners costs for removal and installation, at times convenient to the Owner.

B. After the beginning of the warranty period, the Materialman shall not be responsible for lubrication, filter servicing, adjusting of belts and other items normally requiring periodic adjustments, cleaning out strainers, and other normal maintenance operations, all of which shall be the Owner's responsibility.

C. The Engineer/Architect shall have the sole right to establish the beginning of the warranty period for all portions of the project, and if so stated in the Contract, the guarantee period shall not begin until a trial run has been completed with satisfactory operation for the period of time stated in the Contract.

END OF SECTION

SECTION: SHOP DRAWINGS

1.1 Shop Drawings

A. Shop drawings shall include: fabrication, erection, layout, and setting drawings; material lists; manufacturer's catalog sheets and/or descriptive data for materials and equipment showing dimensions, performance characteristics, and capacities; wiring and control diagrams; electrical characteristics, and capacities; and other pertinent information as required to obtain approval of the items involved.
B. Drawings shall be presented in a clear and thorough manner.
C. Minimum sheet size: 8 ½" x 11"
D. Maximum sheet size: 22" x 34"

1.2 Product Data

A. Preparation:
   1. Clearly mark each copy to identify pertinent products or models.
   2. Show performance characteristics and capacities.
   3. Show dimensions and clearances required.
B. Manufacturer's standard schematic drawings and diagrams:
   1. Modify drawings and diagrams to delete information which is not applicable to the work.
   2. Supplement standard information to provide information specifically applicable to the work.

1.3 Materialman Responsibilities

A. Designate in the submittal schedules, the dates for submission and the dates that reviewed Shop Drawings and product data will be required to maintain delivery schedule.
B. Review Shop Drawings and Product Data prior to submission. Materialman shall allocate 10 business days (excluding holidays) in the product schedule for the Engineer's initial review. Additional time may be required for resubmission.
C. Determine and verify:
   1. Catalog numbers and similar data
   2. Conformance with specifications
D. Begin no fabrication or work which required submittals until return of submittals with satisfactory review.

1.4 Submission Requirements

A. Provide a submittal schedule indicating review dates and return dates required to maintain project schedule. Make submittals promptly in accordance with approved schedule.

B. Number of submittals required:

1. Shop Drawings: Submit one copy of electronic data files of all drawings prepared for the project. Electronic data files shall be either an AutoCAD Format (.DWG) or a .PDF format. Raster based scans (.TIF, .PCX, or .GIF) files of manual drawings are not acceptable.

2. Product Data: Submit one electronic copy of product data of all items for which product data is specified in other sections. Electronic data files shall be in a .PDF format.

3. Shop Drawings and Product Data can be provided on a CD-ROM or via e-mail. When submittal data is delivered via e-mail, it is the materialman's responsibility to verify receipt by the Engineer.

C. Submittals shall contain:

1. Transmit each submittal with transmittal letter or Engineer accepted form.

2. Revise and resubmit submittals as required, identify all changes made since previous submittal.

3. Submittal identification number. Submittals shall be numbered consecutively. Resubmittals shall use the same submittal number with an alphabetic suffix added.

4. The date of submission and the dates of any previous submissions.

5. The Owner's name, project title and number.

6. Contract Identification.

7. Identification of the project, with the specification section number.

8. Relation to adjacent or critical features of the work or materials.

9. Applicable standards, such as ASTM or Federal Specification numbers.

10. Identification of deviations from Contract Documents.

11. Identification of revisions on resubmittals.

12. A 3" x 3" blank space for Materialman and Engineer stamps.

1.5 Return for Submission

A. The Engineer will return for resubmission all shop drawings submitted without the above specified approval and certification which in the Engineer's opinion contain numerous discrepancies, have not been checked, or do not meet the requirements for submission.

1.6 Review of Submittals

A. The Engineer will review, mark and date all submitted shop drawings. One electronic set will be returned to the Materialman. When submittal date is returned via e-mail, it is the Engineer's responsibility to verify receipt by the Materialman.
B. Resubmit shop drawings are specified above, until satisfactory review has been obtained. Corrections and/or changes indicated on shop drawings by Engineer/Owner shall not be considered as an extra hour of work.
C. After satisfactory "Reviewed" or Furnish as Corrected" has been obtained for all shop drawings, a set of shop drawings marked "FOR CONSTRUCTION" shall be furnished to the Engineer in the format specified above. The "FOR CONSTRUCTION" drawings shall be provided within 21 days of receipt of drawings with a satisfactory review by Materialman.
D. Review of shop drawings by the Engineer will be general only, and such review will not relieve the Materialman of responsibility for accuracy of such shop drawings proper fitting, coordination, construction of work, and furnishing material required by the specifications but not indicated on shop drawings. Review of shop drawings shall not be construed as approving departure from the specifications.

1.7 Engineer Duties

A. Review submittals with reasonable promptness and in accordance with schedule.
B. Initial or signature, and indicate requirements for resubmittal, or satisfactory review of submittal.
C. Return submittals to Materialman for distribution or resubmission.

END OF SECTION

SECTION: PROJECT RECORD DOCUMENTS

1.1 Submittals

A. Comply with pertinent provisions of the Shop Drawings Section.
B. Prior to submitting request for final payment, submit the final Project Record Documents to Engineer for approval.

1.2 Materialman Responsibilities

A. The Materialman shall provide final "As-Built" record drawings of the work with all revisions in incorporated.
B. The Materialman shall provide factory test results, as applicable, for all material furnished.
C. The Materialman shall provide complete operation and maintenance manuals for all equipment furnished.

1.3 Final Drawings

A. At completion of project, the Materialman shall incorporate all revisions into the shop drawings to provide a complete set of final drawings. The drawings shall be marked as "Final-As Constructed".
B. One copy of electronic data files of all drawings prepared for the project. Format shall be AutoCAD 2000 or later, vector based .DWG files. Raster based scans (e.g., .TIF, .PCX, or .GIF) files of manual drawings are not acceptable. Media shall be CD-ROM or via e-mail.

1.4 Factory Test Results

A. The Materialman shall provide, as a minimum, results for all routine or production tests required by the industry standards referenced in the technical sections.
B. The Materialman shall also provide results for any non-routine tests specified in the technical sections.
C. When required in the technical sections, required test results shall be forwarded to the Engineer prior to shipping.
D. Engineer shall have two weeks to review factory test results before shipping.

1.5 Operation and Maintenance Manuals

A. The Materialman shall provide three complete sets of Operations, Maintenance and Instruction Manuals covering all equipment furnished for the project.
B. Contents of Manuals:
    1. Table of Contents and index tabs.
    2. Description of the equipment.
    3. Operating Instructions.
    4. Installation instructions including rigging and lifting details.
    5. Maintenance instructions.
    6. Instruction manuals for installation, operation and maintenance of each accessory device, including oil filling procedures.
    7. Assembly drawings.
    8. Parts lists.
    9. List of recommended spare parts.
    10. List of maintenance tools furnished with the equipment.
    11. Nameplate information and shop order numbers for each item of equipment and component part.
    12. Final As-Constructed shop drawings.
    13. Photographs (if required in specifications).
    14. Certified factory test results.
C. Format
    1. All manuals shall be bound in a binder of suitable size (maximum 2”) for the material to be inserted.
    2. Binders shall be white in color with clear jacket for the insertion of printed cover and edge identification sheets.
    3. Instruction manuals for microprocessor based relays shall be provided in the manufacturers’ original binding or in a separate binder produced by the Materialman with dividers identical to the relay manufacturers’ manual.
    4. All information bound shall be 8 ½” x 11” or accordion folded to this size.
    5. Page dividers with plastic reinforced holes and tabs shall be used to organize Operations and Maintenance Manuals.
    6. Binder cover and edge inserts shall contain Owner’s name, project title, date and subject matter of the manual.
D. Organization
    1. Table of contents shall list all information contained.
    2. Contact information for all major equipment suppliers, Materialman, and subcontractors.
    3. Organize manual by equipment item. Contents as specified above.

1.6 Final Submittal

A. All Record Documents, including final drawings and Operation, Maintenance and Instruction Manuals shall be submitted to Engineer prior to submitting final payment request.

1.7 Changes Subsequent To Acceptance

A. The Materialman has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION

SECTION: POWER CIRCUIT BREAKER

1.1 Reference Standards

A. Published Specifications, standards, tests, or recommended methods of trades, industry, or governmental organizations apply to work in this section where sited Reference Standards and in the listing below.
   1. ANSI/IEEE C37.04-Standard Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
   2. ANSI 37.06-AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis-Preferred Ratings and Related Required Capabilities.
   3. ANSI/IEEE C37.09-Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
   4. ANSI/IEEE C37.10-Standard Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
   5. ANSI/IEEE C37.11-Standard Requirements for Electrical Control for AC High-Voltage Circuit Breaker Rated on a Symmetrical Current Basis.
   6. ANSI/IEEE C57.13- Standard Requirements for Instrument Transformers.
   7. ANSI/IEEE C57.19.01-Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings.
   8. NEMA SG4-2000 (R2005)-Alternating Current High-Voltage Circuit Breakers.

1.2 Proposal Requirements

A. Certification of suitability of proposed materials for application on power system with the service conditions listed in the Data Sheet.
B. Descriptive literature to be furnished with proposal shall include but not limited to:
   1. Breaker Ratings:
      1. Rated maximum voltage
      2. Rated short circuit current
      3. Maximum symmetrical interrupting capability
      4. Maximum asymmetrical interrupting capability
      5. Percent of rating for specified reclosing duty cycle
   2. Outline dimension drawings with weights and anchor bolt layout.
   3. Power supply requirements – as applicable
      a. Spring Operator: Trip/close and motor start/run currents
      b. Magnetic Operator: Steady State and Charging currents
   4. Current transformer data
   5. Special tool requirements
   6. Time to charge operator mechanisms
   7. Annual Maintenance Requirements

1.3 Submittals

A. Shop drawings shall be submitted for approval in accordance with the Shop Drawing Section.
B. Submittals shall consist of, but not limited to, the following:
    1. Outline Dimension Drawing with Weights.
    2. Foundation Requirements:
        a. Foundation loading and moment reactions for operations, wind, and seismic loading.
        b. Controlling load condition.
    3. Terminal Displacement/Deflection Information:
        a. Wind
        b. Seismic
    4. Seismic Qualification Report (not required for 34.5 Kv class or below)
    5. Anchor Bolt specifications (material) and layout
    6. Schematics
    7. Power Supply requirements-as applicable
        a. Spring Operator: Trip/close and motor start/run currents
        b. Magnetic Operator: Steady State and Charging currents
    8. Wiring Connection Diagrams
    9. Current Transformer Data
    10. Bushing Data/Drawings
    11. Nameplate and Engraving Drawing
    12. Installation Instructions
    13. Operating Instructions
    14. Final Certified Test Reports
C. Final Drawings, Manuals, and Test Reports shall be provided prior to shipment in accordance with the Project Record Documents Section.

1.4 Service Conditions

A. Service conditions are shown on the Data Sheet Section.

1.5 Warranty

A. All materials and equipment supplied under this specification shall be warranted as outlined in the General Conditions.

1.6 Manufacturers

A. Power circuit breakers approved for this project are shown on the Data Sheet Section.

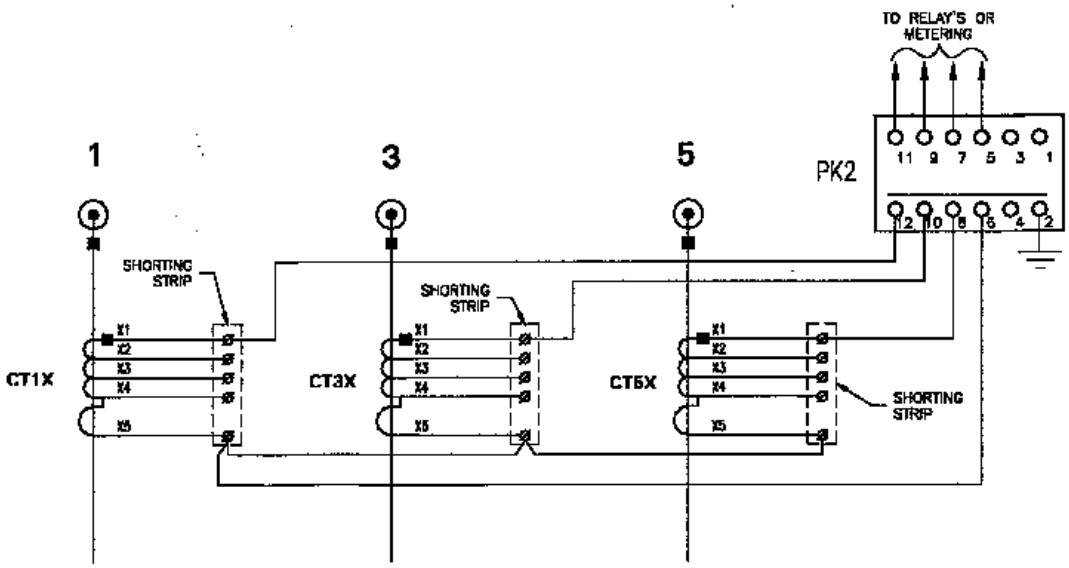
1.7 Materials

A. Power circuit breaker equipment ratings are shown on the Data Sheet Section.
B. Operator Mechanism:
    1. See the Data Sheet Section for specific Operator Mechanism requirements.
    2. Spring Breaker Operator: Circuit breaker utilizing a motor charged spring operator shall provide and open/close/open cycle without recharging of the spring mechanism. Spring charged stored energy mechanism shall be normally charged by a universal motor with provisions for manual handle for manual emergency closing and testing. The motor shall recharge spring in 10 seconds or less.
    3. Magnetic Actuator Breaker Operator: Circuit breaker utilizing a magnetic actuator shall incorporate a stored energy process to provide an open/close/open cycle without electric power supply to the operator. The stored energy equipment shall recharge in 10 seconds or less.
C. Gas Monitoring System (where applicable):
        1. Gas Pressure Gauge: Gauge shall be scaled in US units (pounds per square inch-PSI)
        2. Piping shall allow isolation of the interrupters to allow adjustment of low pressure alarm and lockout switches.
        3. Gas system shall allow refilling of the interrupters in the field.
D. Controls:
    1. Temperature compensated gas density switch with separate low pressure alarm, trip, and lockout contacts. Label/nameplate shall be affixed inside of cabinet indicating the alarm, trip, and lockout gas pressure/settings.
    2. Alarm contacts shall be isolated from “C” provided for the Owner’s use as indicated below:
        a. Manufacturer’s standard alarm points.
        b. Loss of Power to spring Charging Motor or Magnetic Actuator.
        c. Loss of DC Power Supply
        d. Low Gas Alarm and Low Gas Lockout.
    3. Control circuits shall contain provisions for Protective Relay Trip and Block Close interlocks from external devices.
    4. Control switch (also see the Data Sheet Section)
    5. Remote/local control selector/transfer switch (also see the Data Sheet Section)
    6. Position-Indicating Lamps (one red, one green) shall be mounted inside control cabinet, GE LED Type ET 16.

7. Minimum of 8 NO and 8 NC auxiliary switch contacts in addition to those required for operation for Owner's use.

E. Control Cabinet:
   1. Control Cabinet condensation heater with thermostat or positive temperature coefficient heaters.
   2. 120 VAC, GFI Receptacle.
   3. Cabinet interior light (120 VAC), suitable for application and protected from accidental breakage, automatically controlled by cabinet door.
   4. Terminal Blocks for connection of Owner's cable shall be suitable for un-insulated ring terminals and No. 10AWG conductor.
   5. Controls shall be mounted in NEMA 3R weatherproof enclosure. All controls shall be accessible standing at ground level.

F. Current Transformers:
   1. All relay class bushing current transformers (BCT) shall be 5 lead, multi-ratio type with fully distributed windings with a minimum continuous current rating factor of 2.0 Ratio, Accuracy Class and location shall be as indicated on the Data Sheet Section.
   2. Bushing Current Transformer Wiring:
      a. All bushing current transformer leads shall be pre-wired to shorting type terminal blocks in the main control cabinet. From these terminal blocks, leads will be prewired to GE 6-pole PK-2 test blocks. The ratio and connection (wye or delta) will be formed at the shorting type terminal blocks. Therefore, for a three-phase transformer, one 6-pole PK-2 block will be required for each set of three-phase BCTs. A 4-pole PK-2 test block should be used for BCT circuit that is not a three-phase set.
      b. Incoming BCT wiring to the PK-2 test blocks shall be terminated on the bottom of the block and the outgoing (relay/meter) wiring shall be terminated on the top of the block. For three-phase BCT sets, the H1 or X1 polarity lead shall be on left as viewed from the front of the panel.
      c. Wiring from PK-2 blocks to terminal blocks for connection to external circuits shall be provided.
      d. The shorting type terminal blocks shall be marked to identify CT ratio connections.
      e. All secondary leads of the current transformers shall have a 150°C temperature rating and be #12 AWG, minimum.
      f. An example showing the specified three-phase BCT circuit is shown below.



g. Each CT shall have a unique alphanumerical designation on the transformer's main nameplate.
h. Labeling adjacent to the shorting type terminal blocks shall identify the CT using the transformer's main nameplate designation.
i. Phenolic nameplates adjacent to the PK-2 block shall identify the connected CT(s) using the transformer's main nameplate designations.

G. Main contact Position Indicator
H. Closing circuit shall contain a manually-reset closing circuit cut-out Switch (69) opened by breaker manual trip mechanism.
I. GE PK-2 test blocks, 4-pole and/or 6-pole. Quantity and wiring for operation as shown on attached drawings (also see the Data Sheet Section).

1.8 Accessories

A. Standard NEMA Accessories, as appropriate for the device.
B. One travel recorder mounting device, if appropriate for the device.
C. One gauge for checking circuit breaker contact wear, if appropriate for the device.
D. Field kit for installation of insulating gas, if appropriate for the device.

E. Phenolic Nameplates, black with white core letters, shall be provided for all control and bypass switches and indicating lights and any major items of equipment mounted in the relay and control cabinets. Proposed engraving shall be submitted for approval.

1.9 Protective Relaying and Metering

A. Protective Relaying and Metering information is shown in the Data Sheet Section.

1.10 Fabrication

A. Operating mechanism shall have the following (when appropriate):
    1. Means to prevent overcharging of spring.
    2. Means to prevent insufficiently charged spring from attempting to close breaker.
    3. Mechanical indication that spring is charged, not fully charged or discharged.
B. All Equipment control and power leads shall be prewired to terminal blocks for external connection. Terminal blocks shall be marked to identify leads.
C. All control wiring shall use un-insulated ring terminals.
D. Wiring shall be clearly labeled, without splices or tee connections, and bundled as appropriate for usage.
E. When separate Control and Operator Cabinets are required by manufacturers' design, all cabling between cabinets shall be suitably protected by rigid or flex conduit with suitable fittings.
F. Supply circuit for cabinet heaters shall be separately fused (not connected to control fuses). Strip heaters shall be located such that residue from the heater will not fall onto breaker electrical, mechanical, or operating parts. Heater shall not be located in a manner that will damage breaker wiring, relays, or other breaker materials. Heater shield shall not be painted or otherwise coated with any material that will give off fumes or residue when heated. Heater wiring shall utilize high temperature conductor insulation.
G. All control cabinets shall be weatherproof with hinged access door complete with handle type latching mechanism with provision for locking with a padlock in a closed position. Provisions shall be included for maintaining the door in a fully opened position for maintenance within the control cabinet.
H. Relay and control equipment shall be mounted on hinged swing out panel mounted inside control cabinet.
I. Relay/Control and Bushing Current Transformer Wiring shall be in accordance with the attached drawings.
J. Adjustable frame with extensions as required to place bottom of high voltage bushings a minimum of 8'-6" above breaker foundation and live parts a minimum elevation above breaker foundation as listed below:

    15.5 Kv 9'-0"
    25.0 Kv 10'-0"

34.5 Kv	10’-0”
46.0 Kv	10’-0”
69.0 Kv	11’-0”
115.0 Kv	12’-0”
138.0 Kv	13’-0”
161.0 Kv	14’-0”

K. All surfaces of breaker frames, tanks, operating mechanisms, and other parts exposed to possible corrosion shall be weatherproofed and designed to prevent accumulation of moisture. Those surfaces that require painting shall be chemically cleaned and given a minimum of two coats of rust-inhibitive paint a minimum of three mils in total thickness. Coating shall meet ANSI B117 Salt Spray requirements.

1.11 Power Circuit Breaker Testing

A. Required Testing: Tests designated as routine in the latest revision of ANSI/IEEE C37.09.
B. Certified copies of the test data shall be furnished and approved by the Engineer before the breaker is shipped.
    1. Test data shall include but not limited to the following:
        a. Data Sheets from all specified tests.
        b. Data Sheets for all other routine tests complete by the Materialman, but not specified by the Engineer.

END OF SECTION

SECTION: DATA SHEET

69kV Power Circuit Breaker

Bid shall include the fabrication and delivery of power circuit breaker(s).

1.1 Service Conditions

A. The power circuit breaker(s) will be installed in a 69:13 Kv substation for transformer protection.
B. Elevation: Less than 3,000 feet about main sea level.
C. Ambient Temperature Range: -25°C to 50°C
D. System Voltage:
   Nominal: 68,800 Volts 60 Hz
   Operational: 72,500 Volts 60 Hz
E. Substation Transformer Bank:
   68 . 8 : 13 . 09 Kv Delta/Wye – GND
   30/40/50 MVA ONAN/ONAF/ONAF 8.5 % Z
F. System Grounding:
   69 Kv Bus: Solid
   Coefficient of grounding 2.36
G. System Fault Current Levels:
   69Kv Bus: 11,250 3-Phase/Amps X/R=12.4
   7,750 Single-Phase/G Amps X/R=17.6
H. Duty Cycle:
   a. Open-15s, CO-180s, CO
I. Seismic Requirements:
   1. The power circuit breaker, when installed with manufacturer's supplied mounting frame and specified anchor bolts, and Owner supplied flexible jumper connections to circuit breaker terminals shall be qualified according to IEEE 693-2005, "Recommended Practice for Seismic Design of Substations" (Annex C) and meet the requirements below:
      a. Seismic Qualification Level: Moderate
      b. PGA = 0.19g
      c. The circuit breaker shall be qualified by the following method based on voltage class:
         1) 169 Kv and above — By Dynamic Analysis or time history and Sine beat shake-table testing
         2) 121 Kv to less than 169 Kv — By Dynamic Analysis
         3) 35 Kv to less than 121 Kv — By Static coefficient method
         4) Less than 35Kv — Inherently Qualified
      d. Importance Factor (Earthquake) (IFE) =1.25
         Anchorage =2.0
      e. Site Class: C

f. Seismic coefficients:

SMS = 0.48
SM1 = 0.19
SDS = 0.32
SD1 = 0.12

1.2 Manufacturers

A. Power circuit breakers by the following manufacturers are approved for bidding:

1. ABB
2. Areva
3. HVB
4. Siemens

1.3 Materials

A. Power circuit breaker equipment ratings:
   1. Breaker Design: Dead Tank
   2. Interrupting Medium: Vacuum or SF6
   3. Maximum System Voltage: 72.5Kv
   4. Continuous Current Rating: 1200 Amps
   5. Interrupting Rating: 31.5 Ka
   6. Maximum Operation Time: 3 Cycles
   7. Basic Impulse Level: 350 Kv
   8. Bushing current transformers shall be as specified in Section Power Circuit Breakers. Ratio, Accuracy class and location shall be as follows (X-position is adjacent to bushing terminal):

	Ratio	Accuracy Class
Bushings 1,3 and 5:		
X Position	1200:5	C800
Bushings 2, 4 and 6:		
X Position	1200:5	C800

   9. Dual trip coils are required.
   10. Auxiliary Equipment Ratings:

Trip Voltage: 125 Volt DC

Close Voltage: 125 Volt DC

Motor Voltage: 240 Volt, AC, 3 wire single phase/ 125VDC

Heater Voltage: 240 Volt, AC, 3 wire single phase

11. Operating Mechanism: Motor charged spring. Motor shall be AC/DC Universal motor wired so that upon loss of AC it will automatically switch to DC power.
12. Stored energy shall provide an open/close/open cycle without recharging of the spring mechanism assembly.
13. Bushings shall be porcelain, ANSI No. 70, Light Gray, standard creep at the appropriate BIL level for the voltage class. Bushings shall be equipped with stud terminals and NEMA 4-hole tin-plated pads. Bushings supplied for 158 Kv class shall provide a minimum of 10 inches clearance from "live parts" to the metal enclosure top.
14. Color: ANSI No. 70, Light Gray.

1.4 Control Switch Equipment

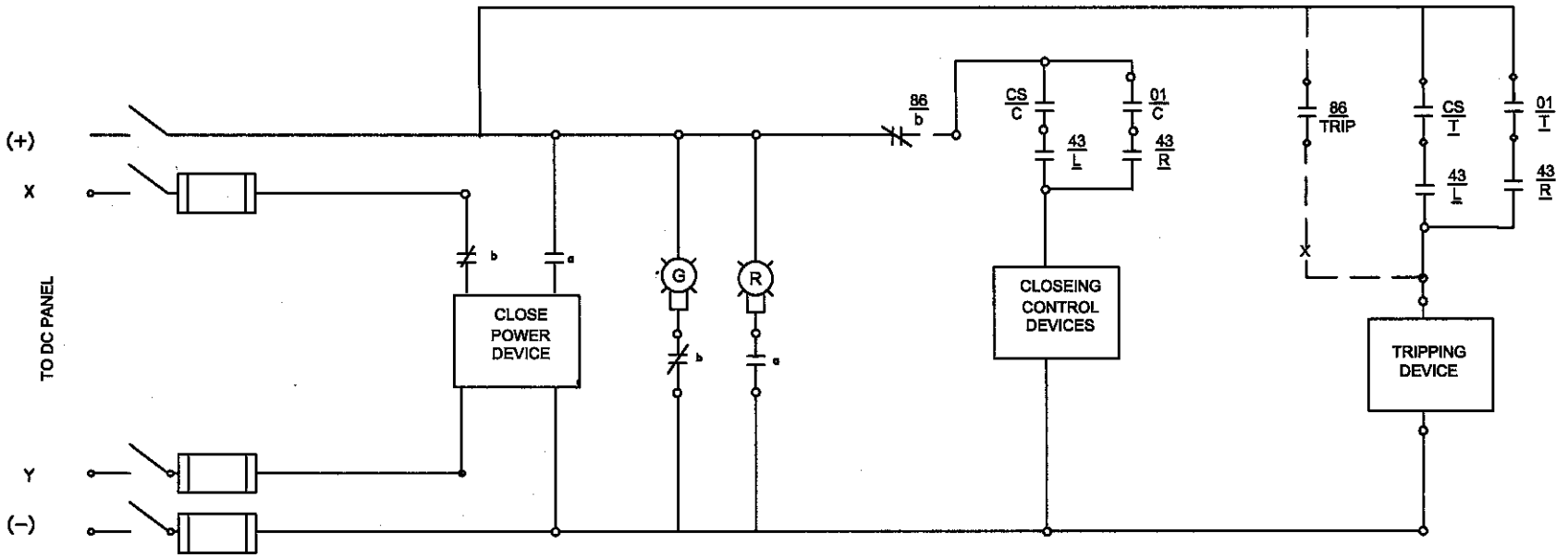
A. Breaker Control Switch shall be Electroswitch Series 24, Type CSR for remote operation, 125 VDC, Circuit 57, for electrical closing and opening of breaker.
B. Remote/Local Control Transfer Switch. Switch shall prevent breaker operation from remote location when the "local" position. Protective relay tripping shall remain functional. Switch shall be Electroswitch.

1.5 Protective Relaying and Metering

A. GE PK-2 current test blocks, 4-pole and/or 6-pole. Type and quantity as required for operation as shown in the attached drawings.

END OF SECTION

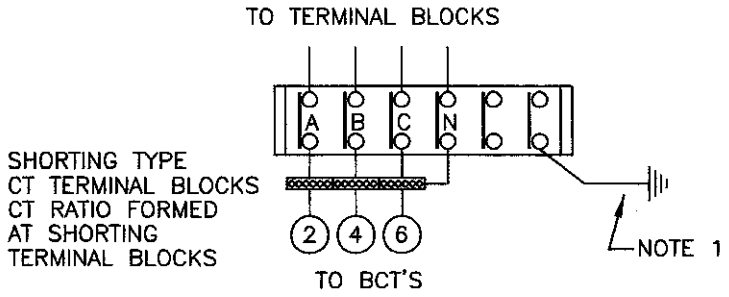
NOTES:
1. " + " AND " - " INDICATES 125 VDC
2. " X " AND " Y " INDICATES 240 VAC



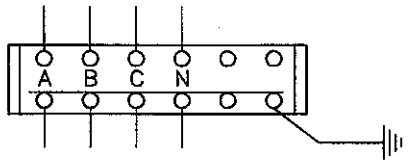
LEGEND

X TEST POINT
--- INDICATES REMOTE CONTACT
o TERMINAL BLOCK POINT

BUSHING 2–4–6
TEST BLOCK WIRING



COVER ON
(FRONT VIEW)

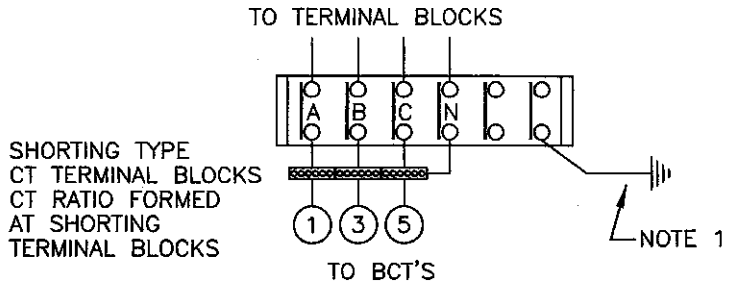


COVER OFF
(FRONT VIEW)

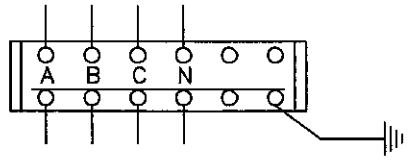
NOTES:

1. DO NOT GROUND (N) AT ANY OTHER PLACE. CTs GROUNDED AT BREAKER ONLY WHEN PK BLOCK IS REMOVED.

BUSHING 1–3–5
TEST BLOCK WIRING



COVER ON
(FRONT VIEW)



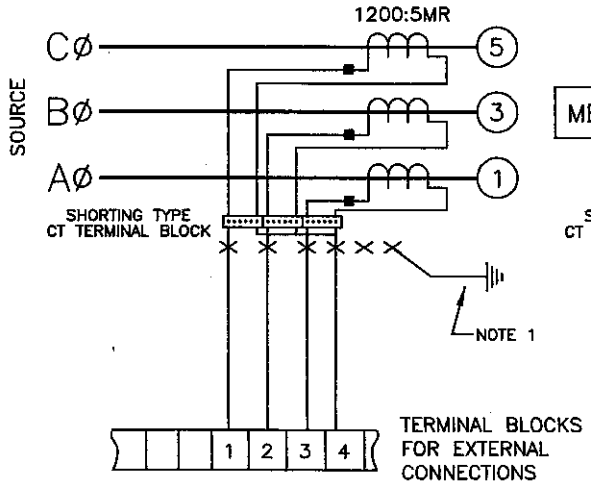
COVER OFF
(FRONT VIEW)

DRAWN		JOB NO.	51347
CHECKED		DATE	JUNE2009
APPROVED		SCALE	NONE

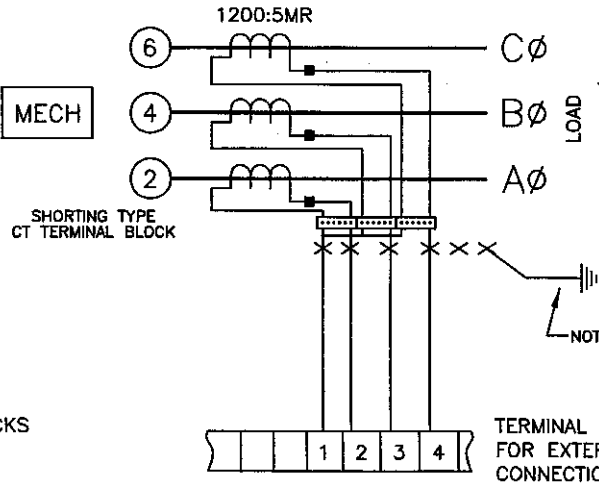
69kV 1200 AMP
POWER CIRCUIT BREAKER

TYPICAL PK–2 TEST
BLOCK WIRING

DRAWING NO.



MECH



NOTES:

1. DO NOT GROUND (N) AT ANY OTHER PLACE. CTs GROUNDED AT BREAKER ONLY WHEN PK BLOCK IS REMOVED.
2. ALL CT LEADS SHALL BE WIRED TO SHORTING TYPE TERMINAL BLOCKS

LEGEND

X TEST BLOCK WITH COVER, G.E. PK–2

DRAWN		JOB NO.	B1347
CHECKED		DATE	May2012
APPROVED		SCALE	NONE

69kV 1200 AMP POWER CIRCUIT BREAKER

CURRENT TRANSFORMER CIRCUIT

DRAWING NO.