INVITATION FOR BID

ATTENTION: This is not an order. Read all instructions, terms, and conditions carefully.

INVITATION NO.: K-0906-19
Issue Date: 4-15-19
Title: 12 KV, 1200 Amp breakers
Contracting Officer: Jim Sutton
Phone: 859-257-5406

RETURN ONE ORIGINAL COPY AND ONE CD OF BID TO:
UNIVERSITY OF KENTUCKY PURCHASING DIVISION BID DESK,
BID #_K-0906-19, BID DATE _05-07-2019
322 PETERSON SERVICE BLDG.
411 South Limestone
LEXINGTON, KY 40506-0005

Issue Date: 4-15-19
Title: 12 KV, 1200 Amp breakers
Contracting Officer: Jim Sutton
Phone: 859-257-5406

IMPORTANT: BIDS MUST BE RECEIVED BY 05-07-2019 @ 3:00 P.M. LEXINGTON, KY TIME

The University’s General Terms and Conditions and Instructions to Bidders, viewable at www.uky.edu/Purchasing/terms.htm, apply to this Invitation for Bid. When the Invitation for Bid includes construction services, the University’s General Conditions for Construction and Instructions to Bidders, viewable at www.uky.edu/Purchasing/ccphome.htm, apply to the Invitation for Bid.

AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST
I hereby swear (or affirm) under the penalty for false swearing as provided by Kentucky Revised Statutes (KRS) 523.040:
1. That I am the bidder (if the bidder is an individual), a partner, (if the bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the bidder is a corporation);
2. That the attached bid has been arrived at by the bidder independently and has been submitted without collusion with, and without any agreement, understanding or planned common course of action with, any other vendor of materials, supplies, equipment or services described in the Invitation for Bids, designed to limit independent bidding or competition;
3. That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid or bids and will not be communicated to any such person prior to the official opening of the bid or bids;
4. That the bidder is legally entitled to enter into contracts with the University of Kentucky and is not in violation of any prohibited conflict of interest, including those prohibited by the provisions of KRS 164.390, 45A.330 to 45A.340.
5. That the Bidders, and its affiliates, are duly registered with the Kentucky Department of Revenue to collect and remit the sales and use tax imposed by Chapter 139 to the extent required by Kentucky law and will remain registered for the duration of any contract award.
6. That I have fully informed myself regarding the accuracy of the statement made above.

COLLUSION PROHIBITED
Any agreement or collusion among bidders or prospective bidders which restrains, tends to restrain, or is reasonably calculated to restrain competition by agreement to bid at a fixed price or to refrain from bidding, or otherwise, is prohibited, in accordance with KRS 45A.325.

SWORN STATEMENT OF COMPLIANCE WITH CAMPAIGN FINANCE LAWS
In accordance with KRS 45A.110(2), the undersigned hereby swears under penalty of perjury that he/she has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky and that the award of a contract to a bidder will not violate any provision of the campaign finance laws of the Commonwealth of Kentucky.

CONTRACTOR REPORT OF PRIOR VIOLATIONS OF KRS CHAPTERS 136, 139, 141, 337, 338, 341 & 342
The contractor, by signing and submitting a bid on this invitation, agrees as required by KRS 45A.485 to submit final determinations of any violations of the provisions of KRS Chapters 136, 139, 141, 337, 338, 341 and 342 that have occurred in the previous five (5) years prior to the award of a contract and agrees to remain in continuous compliance with the provisions of these statutes during the duration of any contract that may be established. Final determinations of violations of these statutes must be provided to the University by the successful contractor prior to the award of a contract.

ALL BIDS ARE TO BE "F.O.B. DESTINATION – FREIGHT PREPAID AND ALLOWED"

THIS AREA MUST BE COMPLETED

DELIVERY AFTER RECEIPT OF ORDER: NAME OF COMPANY: PHONE:
FEDERAL EMPLOYER ID NO.: ADDRESS: FAX:
PAYMENT TERMS: ADDRESS: E-MAIL:
SHIPPING TERMS: F.O.B. DESTINATION – PREPAID AND ALLOWED CITY, STATE & ZIP CODE: WEB ADDRESS:
DUNS #: SIGNATURE: DATE:

SIGNATURE REQUIRED: This bid cannot be considered valid unless signed and dated by an authorized agent of the bidder.

Type or print the information requested in the spaces provided.

Revised January 5, 2017
UNIVERSITY OF KENTUCKY
INSTRUCTIONS TO BIDDERS

All University of Kentucky bid solicitations are made upon and subject to the following conditions:

1 Preparation of Bids

1.1 All solicitations are subject to the provisions and requirements of any applicable Kentucky Revised Statutes, including the Kentucky Model Procurement Code, and the rules, regulations and policies of the University of Kentucky including the University of Kentucky’s General Terms and Conditions.

1.2 Bidders are expected to examine the complete bid and all attachments including drawings, specifications and instructions. Failure to do so is at bidder’s risk.

1.3 Bidders shall furnish information required by the solicitation in the form requested. The University reserves the right to reject bids with incomplete information or which are presented on a different form.

1.4 All bids must be legible. A legally authorized company representative shall sign all bids in the appropriate location. Erasures or other changes must be initialed by the person signing the bid. Signature on a bid certifies that the bidder has read and fully understands all bid specifications and bidder agrees to all terms and conditions stipulated in the Invitation For Bids (IFB).

1.5 Bid prices shall be entered in spaces provided on the bid form. All unit prices and mathematical extensions and totals shall be indicated where required. In cases of errors in extensions or totals the unit price will govern.

1.6 Should any potential bidder doubt the true meaning of any part of the solicitation, a written request for an interpretation may be submitted to the University. Requests for such interpretation shall be made in writing to the appropriate Contracting Officer identified in the solicitation. Every interpretation made shall be in the form of an “addendum” to the solicitation sent as promptly as is practicable to all prospective bidders to whom the solicitation has been issued. Failure by the University to send or any potential bidder to receive such interpretation(s) shall not relieve any bidder from any obligations under the bid solicitation or the bidder’s response. Any interpretations, corrections or changes to the solicitation made in any other manner, including oral explanations and instructions, are not binding upon the University.

1.7 Bidders or potential bidders are required to coordinate all discussions concerning solicitations through the appropriate Contracting Officer or other purchasing official within the University of Kentucky Purchasing Division. Bidders or potential bidders are not authorized to communicate with any University administrator, faculty, staff, or Board of Trustees member concerning this solicitation. Failure to comply with this requirement is grounds for the bidder’s disqualification.

1.8 Unless otherwise stipulated in a bidder’s response, the bidder’s offer is in strict accordance with the University’s specifications and terms and conditions of the Invitation For Bids. Any deviations must be fully itemized in detail. Any deviations from the requirements of this solicitation are at bidder’s risk and the University may determine the bid to be non-responsive.

2 Submission of Bids

2.1 Bids, and modifications thereof, shall be returned in a sealed envelope and submitted in such a manner as to ensure their arrival in the University of Kentucky Purchasing Division before the due date and time set forth in the solicitation. The time shown on the recording clock in the Purchasing Division is the official time. Unless otherwise indicated in the solicitation no oral, facsimile, e-mail or telephone bids will be accepted.

2.2 Bids may be modified or withdrawn in writing or in person by an authorized representative if done so prior to the exact time and date for receipt of the bids. Telephone and facsimile modifications or withdrawals are not permitted. Withdrawn bids may be resubmitted, with or without modifications, up to the solicitation due date and time. No bids may be withdrawn after the due date and time without the express authorization of the University of Kentucky Purchasing Division.
2.3 Bids received after the designated time and date in the solicitation will not be considered. Bids will or will not be publicly opened and read in accordance with the Invitation For Bids.

2.4 Bidders shall show the bid due date and time, the solicitation number, and the name and address of the bidder on the face of the bid envelope.

2.5 All bids will be considered firm for a period of forty-five (45) calendar days from the bid opening date.

3 Specification Requirements

3.1 Unless otherwise specified in the solicitation, all items bid are to be new, unused, and not remanufactured in any way.

3.2 Whenever a trade name, brand name, or model and catalog numbers followed by the words “or equal” or “approved equal” are used in the bid invitation it is for the purpose of item identification and to establish standards of quality, style, and features. Bids on equivalent items, substantially the same, are invited. However, to receive consideration, sufficient descriptive literature and/or specifications to clearly identify the item and provide for competitive evaluation must accompany the bid. The University will be the sole judge of equality and suitability. If bidder does not identify exceptions to the specifications shown in the IFB, bidder will be required to furnish the brand name(s), models, numbers, etc. specified in the IFB.

3.3 Unless stated otherwise in the solicitation, alternate bids will be considered. Alternate bids may be made in addition to responding to the solicitation or as the only response to the solicitation. However, the University is under no obligation to consider or accept an alternate bid and it reserves the right to reject any and all such bids.

3.4 The University reserves the right to request samples of any or all items bid in order to determine compliance with the specifications. The bidder must provide the samples within ten (10) days of the request and at no charge to the University. Samples are non-returnable. Failure to comply may be cause for rejection of the bid.

3.5 Bidders shall clearly delineate any deviations or exceptions from the bid specifications.

3.6 Except as otherwise provided in the solicitation, all bid prices must be firm. Prices subject to qualifications, such as escalation or other variables, may be rejected as non-responsive.

3.7 Unless otherwise stipulated in the solicitation, all quantities are estimates and do not represent a minimum guarantee. The University is obligated to purchase only those quantities needed during the term of the contract and it reserves the right to purchase more or less than the estimated quantities. The University is obligated only for those quantities ordered.

3.8 Proposed delivery dates shall be stated in number of calendar days after receipt of order.

3.9 All offers shall be F.O.B. destination, freight prepaid and allowed.

4 Bid Evaluation and Award

4.1 Bids will be evaluated and the award made to the lowest responsive, responsible bidder who offers the best value to the University and meets the terms, conditions and specifications of the Invitation For Bids.

4.2 The term “Responsible Bidder” means a person, company, or corporation who has the capability in all respects to perform fully the contract requirements and the integrity and reliability that will assure good faith performance. In determining whether a Bidder is responsible, the University may evaluate various factors including (but not limited to) financial resources; experience; organization; technical qualifications; available resources; record of performance; integrity; judgment; ability to perform successfully under the terms and conditions of the contract; and adversarial relationship between the Bidder and the University that is so serious and compelling that it may negatively impact the work performed under this Invitation for Bid; or any other cause determined to be so serious and compelling as to affect the responsibility of the Bidder.

4.3 The University reserves the right to accept or reject any and all bids or part of a bid and waive informalities, technical defects and minor irregularities in the bids received. Further, the University reserves the right to
make a single award, split awards, make multiple awards or no award whichever is in the best interest of the University.

4.4 Unless stated otherwise in the solicitation, the University reserves the right to award the contract to the lowest aggregate bidder for all items, on an item by item basis, or a group of like items whichever is found to be in the best interest of the University. The University will consider bids submitted on an “all or nothing” basis if the bid is clearly designated as such.

4.5 In accordance with KRS 45A.494, a resident bidder of the Commonwealth of Kentucky shall be given a preference against a nonresident bidder. In evaluating proposals, the University will apply a reciprocal preference against a bidder submitting a proposal from a state that grants residency preference equal to the preference given by the state of the nonresident bidder. Resident bidder and nonresident bidder shall be defined in accordance with KRS 45A.494(2) and 45A.494(3), respectively. Any Respondent claiming Kentucky residency status shall submit with its proposal a notarized affidavit affirming that it meets the criteria as set for in the above referenced statute.

4.6 The University shall issue a price contract or purchase order as its notification of award to the successful bidder(s). Until such date a price contract or purchase order is issued, nothing shall be construed to constitute a binding agreement between the University and the bidder.

5 Payment and Taxes

5.1 The successful bidder shall be paid, at the prices stipulated, for items or services delivered and accepted, upon the submission of proper invoices to the billing address shown on the purchase order. The University’s standard payment terms are net 30 days after acceptance.

5.2 Bidders may offer prompt payment discounts. The University will not consider any prompt payment discounts in determining the bid award.

5.3 The University utilizes a procurement card program as the preferred method of payment. The University assumes that all successful bidders will accept the University’s procurement card as a method of payment unless a specific exception is stated in the bidder’s response to the IFB. No additional charges may be added for acceptance of the procurement card.

5.4 The University is tax exempt from the provisions of the Kentucky Sales and/or Use Tax (Tax Exemption # A00276) on materials and equipment under this solicitation. The University is also entitled to exemption from the Federal Excise Tax. All bidders shall take this into consideration when submitting their bid. Exemption certificates will be furnished upon request. Bidders are informed that material purchased by the contractor for the performance of this contract for the University are not exempt from the provisions of the Kentucky Sales and/or Use Tax. All adjustments and allowances for the current sales and/or use tax shall be included in the bid price.

6. Kentucky’s Personal Information Security and Breach Investigation Procedures and Practices Act

To the extent Company receives Personal Information as defined by and in accordance with Kentucky’s Personal Information Security and Breach Investigation Procedures and Practices Act, KRS 61.931, 61.932 and 61.933 (the “Act”), Company shall secure and protect the Personal Information by, without limitation: (i) complying with all requirements applicable to non-affiliated third parties set forth in the Act; (ii) utilizing security and breach investigation procedures that are appropriate to the nature of the Personal Information disclosed, at least as stringent as University’s and reasonably designed to protect the Personal Information from unauthorized access, use, modification, disclosure, manipulation, or destruction; (iii) notifying University of a security breach relating to Personal Information in the possession of Company or its agents or subcontractors within seventy-two (72) hours of discovery of an actual or suspected breach unless the exception set forth in KRS 61.932(2)(b)2 applies and Company abides by the requirements set forth in that exception; (iv) cooperating with University in complying with the response, mitigation, correction, investigation, and notification requirements of the Act, (v) paying all costs of notification, investigation and mitigation in the event of a security breach of Personal Information suffered by Company; and (vi) at University’s discretion and direction, handling all administrative functions associated with notification, investigation and mitigation.
SCOPE

This Invitation for Bid is for the Purchase of 1200, three Phase, outdoor distribution circuit breakers for the University of Kentucky, Campus Physical Plant Division, Lexington, Kentucky.

TERMS AND CONDITIONS

The University’s General Terms and Conditions and Instructions to Bidders, viewable at www.uky.edu/Purchasing/terms.htm apply to this Invitation to Bid.

RESTRICTIONS ON COMMUNICATIONS WITH UNIVERSITY STAFF

From the issue date of this IFB until a Contractor is selected and a contract award is made, Bidders are not allowed to communicate about the subject of the IFB with any University administrator faculty, staff, or members of the Board of Trustees except:

- The Purchasing Office representative, any University Purchasing Official representing the University administration, or others authorized in writing by the Purchasing Office and
- University Representatives during Bidders presentations.

If violation of this provision occurs, the University reserves the right to reject the Bidder’s proposal.

INVITATION SUBMISSION AND DEADLINE

The University of Kentucky accepts deliveries of IFB’s Monday through Friday from 8:00 am – 5:00 pm Lexington Kentucky time. However, IFB’s must be received by 3:00 pm Lexington Kentucky time on the date specified on the IFB in order to be considered.

NOTE: Bidders are requested to include a CD with their bid response in addition to the printed hard copy of the bid.

Specification 337723S01 Medium Voltage Circuit Breaker

1.0 DESCRIPTION
These general specifications cover 1200- and 2000-amp, three-phase, outdoor distribution circuit breakers that utilize vacuum bottle technology as the method of arc suppression.

2.0 RATINGS

<table>
<thead>
<tr>
<th>Identification</th>
<th>Ratings</th>
<th>Related Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insulation Level</td>
<td>Current Amps</td>
</tr>
<tr>
<td>Rated Continuous Current at 60 Cycles</td>
<td>Low Freq. (kV, RMS)</td>
<td>Impulse (kV, Crest)</td>
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<tr>
<td>1200 Amps</td>
<td>2.4-14.4</td>
<td>15.5</td>
</tr>
<tr>
<td>2000 Amps</td>
<td>2.4-14.4</td>
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3.0 CONDITIONS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Unit</th>
<th>1200 Amp</th>
<th>2000 Amp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightning Impulse Withstand Voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Wave 1.2/50 psec</td>
<td>kV</td>
<td>110</td>
<td>110</td>
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<tr>
<td>Chopped Wave 2psec</td>
<td>kV</td>
<td>142</td>
<td>142</td>
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<tr>
<td>Chopped Wave 3psec</td>
<td>kV</td>
<td>126</td>
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<tr>
<td>Reclosing Time</td>
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<td>20</td>
<td>20</td>
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<tr>
<td>Permissible Tripping Delay</td>
<td>sec</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Closing Time</td>
<td>cycles</td>
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<td>6</td>
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<tr>
<td>Transient Recovery Voltage</td>
<td>kV, Peak</td>
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<tr>
<td>Capacitance Switching</td>
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<tr>
<td>Open Wire Line Charging Switching</td>
<td>Amps</td>
<td>600</td>
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<tr>
<td>Isolated Cable Charging</td>
<td>Amps</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Isolated Capacitor Bank Switching</td>
<td>Amps</td>
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<td>600</td>
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<tr>
<td>Minimum Phase Spacing</td>
<td>Inches</td>
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<tr>
<td>Minimum External Creep</td>
<td>Inches</td>
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<tr>
<td>Minimum External Strike Terminal To Ground</td>
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<td>6</td>
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<tr>
<td>Auxiliary Voltage</td>
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<td>Control Cabinet Heater</td>
<td>VAC</td>
<td>120 - 240</td>
<td>120 – 240</td>
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<tr>
<td>Dual Trip Coils Required</td>
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<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Operating Mechanism</td>
<td>Stored Energy</td>
<td>Stored Energy</td>
<td></td>
</tr>
</tbody>
</table>

4.0 PHYSICAL CHARACTERISTICS
Frame-mounted, outdoor, three-pole, three-phase, 60 Hz, vacuum-interrupting type power circuit breaker.

4.1 Frame Mounted
Frame extension shall provide nine (9) feet of minimum clearance from foundation to live bushing part.

4.2 Finish
Breaker shall be equipped with rain guards, weather sheds, and gaskets on doors and cover plates to prevent the intrusion of inclement weather. Operating the door-closing handle shall compress the gaskets between the door and the breaker cabinet. Breaker shall have painted interior and exterior under coating on a clean, unblemished, and rust-free metal surface. Apply two coats of exterior light gray paint (finish color ANSI-70) inside and out.

5.0 BUSHING CHARACTERISTICS
5.1  1200 Amp Breakers  
Bushings shall be porcelain, 15 kV insulation class, 110 kV BIL, 1200 amps rated continuous current, ANSI-70 color. Bushings shall not be supplied with terminal connectors. The bushing stud terminal shall accommodate a 1.25-inch diameter terminal connector with 12 threads per inch. Note: Notify Customer if dimension or thread is different.

5.2  2000 Amp Breakers  
Bushings shall be porcelain, 15 kV insulation class, 110 kV BIL, 2000 amps rated continuous current, ANSI-70 color. Bushings shall not be supplied with terminal connectors. The bushing stud terminal shall accommodate a 1.50-inch diameter terminal connector with 12 threads per inch. Note: Notify Customer if dimension or thread is different.

6.0  CURRENT DEVICES
6.1  1200 Amp Breakers  
Three (3) 1200/5 multi-ratio bushing current transformers (CTs) shall be supplied on bushings 1-3-5. The accuracy class shall be C-200. Three (3) 2000/5 multi-ratio bushing CTs shall be supplied on bushings 2-4-6. The accuracy class shall be C-400. CT secondary wires shall be terminated in the breaker control cabinet on six short-circuit terminal blocks, with each block having six terminal locations (the last position being a ground). Wiring shall be terminated using ring lugs.

6.2  2000 Amp Breakers  
Three (3) 2000/5 multi-ratio bushing current transformers (CTs) shall be supplied on bushing 1-3-5. The accuracy class shall be C-400. Three (3) 2000/5 multi-ratio bushing CTs shall be supplied on bushings 2-4-6. The accuracy class shall be C-400. CT secondary wires shall be terminated in the breaker control cabinet on six short-circuit terminal blocks, with each block having six terminal locations (the last position being a ground). Wiring shall be terminated using ring lugs.

6.3  1200 - 2000 Amp Breaker Additional CT's  
Breakers to be used as a Main Transformer Breaker or a Bus Sectionalizing Breaker will require a second set of 2000/5 multi-ratio bushing CTs, accuracy class C-400. This set of bushing CTs shall be installed on bushings 1-3-5. Attention to the purchase order will make this clear.

7.0  POTENTIAL DEVICES
7.1  Meter potential will be derived from Substation Bus Potential Transformers mounted in the station steel (by others). Potential Secondary will be supplied out of the station Potential Junction Box to the breaker control panel using 4 conductor cable (by others). The breaker shall have one (1) four-post terminal block mounted in the mechanism cabinet. On this block the 4 conductor potential cable is to be terminated. Breaker supplier shall provide wiring from the terminal block to a 3 pole fuse block. This is a 20 amp circuit to be fused at 3 amps. The 4th cable conductor is to be grounded. This fuse block shall be mounted in the general vicinity of the DC fuse blocks and disconnects.

8.0  OPERATING MECHANISM
8.1  Closing Mechanism  
The non-automatic re-closing breaker shall be equipped with a 125-volt DC operating mechanism. By using 240-volt AC coils and a universal motor for charging the spring, the operating mechanism may be operated with 120 volts AC in an emergency. Note: Use of a rectifier circuit and a DC closing coil are NOT acceptable. Mechanism shall include a motor-charged spring with provisions for manual charging. Provisions for manually closing the breaker shall also be included.

8.2  Tripping Mechanism  
Breaker shall be equipped with 125-volt DC wet-cell battery trip coils. A manual trip device shall also be provided.
8.3 AUXILIARY SWITCHES AND ACCESSORIES
The following items shall be provided on all breaker sizes:

1. 10-Stage auxiliary switch with spare contacts wired out to terminal block for customer use
2. Latch check switch
3. Operation counter
4. Position indicator
5. Space heater with thermostat controls (100-watt minimum)
6. Two (2) two-hole ground terminal pads to accommodate a two-bolt connector
7. Emergency pull to trip handle with SPST switch to prevent reclosing

8.4 Electrically operated Breaker

Breaker shall function by the separate fused disconnect D.C. Circuits for tipping, closing and metering.

A fused – Disconnect A.C. Circuit shall supply the heater. The fused 3 phased A.C potential circuit shall supply the metering the communication circuit shall be protected by the low-voltage arrester.

9.0 SCADA Communication

Two (2) ASCO Model 180 (LCDP) Series 100 surge suppressor, a two-pair (four-wire) module implementing three-stage hybrid technology. This module addresses over-voltage transients with silicon avalanche components.

Ground wire must be kept as short as possible. These surge protective devices are to be supplied with and mounted in the control cabinet of the breaker.

Miscellaneous wire and mounting hardware to connect the signal to the PM8244 shall be provided and mounted by the breaker supplier.

10.0 MISCELLANEOUS

Wiring from the control panel shall terminate on post terminal blocks located on the back hinge side of the panel. Connection between the panel and the breaker shall be completed in the field by UK electrical personnel, unless the control panel is supplied by the breaker manufacturer in which case mounting, connecting and testing shall be done by breaker manufacturer.

The vendor shall provide four (4) complete sets of prints for each breaker ordered. The prints shall include the following: nameplate, outline, control, elementary and connection diagrams, instruction books and complete renewal parts lists.

The order shall be considered incomplete and payment may be withheld until all prints are received. Prints should be sent to:

University of Kentucky
Peterson Service Building, Room 211R
Lexington, KY 40506-0005
Attn: Facilities Management Department

Shipping instructions for the breakers will be on the individual purchase orders.
Specification 33723316 Medium Voltage Circuit Breaker and Control Panel.

11.0 BREAKER CONTROL PANEL

This panel shall be constructed to mount on hinges in the control panel space of the Myers Controlled Power Medium – Voltage Substation Breaker type FVR and rotate outward for installation and maintenance. Supply the hinge mechanism and retainers for mounting the control panel in the breaker.

11.1 Control Panel Equipment

The control panel shall be supplied with the following items:

1. Breaker Control Switch: This type switch is primarily intended for the control of electrically operated circuit breakers. It shall be of pistol-grip fixed-handle design multi-pole rotary control switch with cam operated momentary contacts (Model SB or Type W). The multi-stage design shall have a six-contact frame with targets and a pull to lock in the trip position. It shall be equipped with red and green LED indicator lights which are powered by the trip circuit. Red indicates the breaker is closed and the trip circuit is complete and energized. Green indicates the breaker is open and the trip circuit is energized.

2. Three (3) indicating ammeters, 0 - 5 amp range, analog.

3. One (1) thermal ammeter with maximum indicator for measuring neutral current, 0-5 amp range.

4. Three (3) phase over-current extremely-inverse relays (ABB CO-Hi – Lo Style number 265CO47A07 or equivalent) with time taps 1-12, including instantaneous attachment having a range of 6 to 144.

5. One (1) residual ground over-current relay (ABB CO-11 Style number 265CO47A07 or equivalent) with time taps 1-12, including instantaneous attachment having a range of 6 to 144.

6. Meter reference number METSEPM8244 DIN rail mounted meter w/ remote display. Modular I/O accessories shall be two METSEPM89M2600 Square D I/O modules: 6 digital inputs and 2 relay outputs (total 12 digital inputs and 4 relay outputs). See section 9.1 for control function connections.

6. Meter potential will be derived from Substation Bus Potentials mounted in the station steel. Potential secondary, out of the station Potential Junction Box to the breaker cabinet, will be supplied by others via a 4 conductor cable. Breaker manufacturer will supply a 4 post terminal block on which to terminate the potential cable in the breaker mechanism cabinet (#12 wire). Wiring from the 4-post terminal block is to be terminated on the three post potential fuse block by breaker manufacturer (4th position to be grounded). The breaker is to have one (1) three post fuse block on which to terminate the potential wires from the control panel.

7. Additional Signals for control:

One (1) ABB type FT test switch for Square D Power Logic Circuit Monitor current circuits, ABB style number 129A518G001

One (1) ABB type FT test switch for Square D Power Logic Circuit Monitor potential and contact inputs, ABB style number 129A501G001
One (1) 4 position terminal block to assist in delivering bus metering potential to the control panel (discussed in 6 above).

One (1) 4 position short circuiting terminal block to assist in delivering relay and metering current on to the control panel.

11.3 RS485 Signal Cable Surge Suppression will be supplied on the breaker control panel along with miscellaneous wire and mounting hardware.

12.1 SCADA EQUIPMENT
12.1.1 1200-Amp and-2000 Amp Breakers
SCADA equipment is specified for all medium voltage breakers. This is through the Square D CM8244 Circuit Monitor I/O accessory module METSEPM89M2600. The Square D I/O module has 6 digital inputs and 2 relay outputs. This CM8244 Circuit Monitor will require two modules for a total of 12 digital inputs and 4 relay outputs.

12.1.2 The CM8244 I/O module METSEPM89M2600 has two output relays that operate on 24-volt DC only. For this reason, a 130-volt DC to 24-volt DC regulated source will be required. The 130-volt DC power for this circuit should come from the same fuse from which the CM8244 is sourced. The power required to operate this device is small since it is only needed to operate three Potter & Brumfield 24 volt DC type KRP relays. These relays will be de-energized except when it is necessary to operate the breaker remotely. The KRP's should be equipped with indicator lights in the relays to help determine when the relay coil is energized.

12.1.3 One of the KRP relays in the remote control circuit should be labeled RC for “Remote Close”. It should operate to close the breaker when the CM8244, I/O module #1 contacts labeled [1] and [2] close. The normal closed state for the CM8244, I/O module #1 is labeled [1] and [3]. A contact from the KRP should be in the breaker close circuit and will cause the breaker to close when the CM8244, I/O module #1 relay contacts labeled [1] and [2] close.

12.1.4 One of the KRP relays in the remote control circuit should be labeled RT for “Remote Trip”. It should operate to trip the breaker when the CM8244, I/O module #1 contacts labeled [4] and [5] close. The normal closed state for this contact on the CM8244 I/O module #1 is labeled [4] and [6]. A contact from the KRP should be in the breaker trip circuit and will cause the breaker to trip when the CM8244, I/O module #1 relay contacts labeled [4] and [5] close.

12.1.5 The third KRP relay in the remote control circuit should be labeled RTC for “Remote Trip/Close”. It should operate to supply 24 volt DC power to the RT and RC relays when the CM8244, I/O module #2 contacts labeled [1] and [2] close. The normal closed state for this contact on the CM8244, I/O module #2 is labeled [1] and [3]. This relay is energized first to start the remote trip and close operation of the breaker. The CM8244, I/O module #2 relay will hold itself in for 30 seconds or until the breaker operates. After 30 seconds, the remote control circuit will return to a de-energized state.

12.1.6 There should be a 3PDT-type toggle switch as an IEEE 43 mounted on the control panel, in line with the control switch. One third of this switch should be in the RT relay’s breaker trip circuit. Another third should be in the RC relay’s breakers close circuit. The last third should connect to the CM8244 digital input. This will show the dispatcher the breaker remote control is ON and ready to be operated. It shall be labeled Remote Control ON and Remote Control OFF.

13.0 Electrical Testing of the Breaker Control Panel.

13.1 A control panel is typically made up of:
1. Trip Circuit
2. Close Circuit
3. Metering Potential Circuit
4. Metering Control Circuit 130 volt DC and 24 volt DC
5. Communication Circuit
Using a 500 volt Megger, attach one side to the panel ground. Attach the test lead to the circuit being tested. The circuit should withstand 300 volts for one minute. The 24 volt portion and the 125 volt DC to 24 volt DC power supply and the CM8244 should not be exposed to test voltage on either side of the CM8244 or the 125 volt DC to 24 volt DC power supply.
The Communication Circuit should only be tested to 50 volts. Disconnect the cat6 wiring from the CM8244 before testing the communication circuit. The cat 6 surge arrestors should not be exposed to the 50 volt test voltage either.
Apply an AC current of 5 amps to the current circuit one phase at a time. Test for presence of Current in phase A, B, and C and neutral relays and visually verify current in the ammeters.

Looking at the rear of the Breaker Control Panel, the panel hinges should be on the left hand side of the panel. Wiring from the control panel shall terminate on post terminal blocks located on the back left side of the panel. The terminal blocks shall be placed between the hinges of the panel and the equipment on the panel. UK electrical personnel shall complete connection between the panel terminal blocks and the breaker terminal blocks in the field. The control panel must have clearance to swing out on the hinges for maintenance.

If the control panel is manufactured by the breaker manufacturer then install the panel and test both as a unit.

14.1 MISCELLANEOUS

The vendor shall provide four (4) complete sets of prints for each breaker ordered. The prints shall include the following: nameplate, outline, control, elementary and connection diagrams, instruction books and complete renewal parts lists.

The order shall be considered incomplete and payment may be withheld until all prints are received. Prints should be sent to:

University of Kentucky
Peterson Service Building, Room 211R
Lexington, KY  40506-0005
Attn: Facilities Management Department

Shipping instructions for the breakers will be on the individual purchase orders.
## PROPOSAL FORM

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Catalog No. / Description</th>
<th>Qty.</th>
<th>Unit Price</th>
<th>Extended Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1200 AMP Breaker are limited fault clearing capability</td>
<td>3 ea.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Breakers are to be equipped with four ABB electromechanical overcurrent relay and one Snider electronic kWhr meter with test switches and control switch</td>
<td>3 ea.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GRAND TOTAL $_________