



University of Missouri (UM) Procurement

BID REQUEST NO.: 22011

TITLE: 3 PHASE 15kV 6-WAY SWITCHGEAR

ISSUE DATE: JULY 28, 2021

SOURCING CONTACT: WADE A. JADWIN

PHONE NO.: 573-341-4049

E-MAIL: jadwinw@mst.edu

BID DUE DATE: AUGUST 12, 2021 AT 2:00 PM CST

MAILING INSTRUCTIONS: Print or type **Bid Request No. and Due Date** on the envelope. **Bids are to be contained in a sealed envelope and mailed or hand delivered to the address below by the due date and time noted above. FAXED OR E-MAILED BID RESPONSES WILL NOT BE CONSIDERED. The University assumes no responsibility for any bidder's on-time receipt at the designated location for bid opening.**

**RETURN BID TO: University of Missouri Procurement
Attention: Wade A. Jadwin, Strategic Sourcing Specialist
1201 North State Street – Suite G5C
Rolla, MO 65409**

You are invited to submit a bid on the items or services specified. All bids must be made on this form and shall be subject to the terms and conditions included herein. Bidder offers and agrees to furnish and deliver the items or perform the services upon which prices are quoted herein. Any quotations sent to the University of Missouri prior to this request for bid are void and will not be considered.

The bidder agrees the language of this bid document shall govern in the event of a conflict with supplier's bid response. The bidder further agrees that upon receipt of an authorized purchase order from the University of Missouri or when a Notice of Award is signed and issued by an authorized official of the University of Missouri, a binding contract shall exist between the bidder and The Curators of the University of Missouri.

If you have any questions regarding the RFB, please send them to:

Wade A. Jadwin, Strategic Sourcing Specialist
University of Missouri Procurement
1201 North State Street – Suite G5C
Rolla, MO 65409
jadwinw@mst.edu

All questions regarding the RFB must be received no later than August 5, 2021 at 2:00 PM CST.

The University reserves the right to waive any informalities in Request for Bids and to reject any or all bids.

AUTHORIZED BIDDER REPRESENTATION

Authorized Signature	Date
Printed Name	Title
Company Name	
Mailing Address	
City, State, Zip	
Phone No.	Federal Employer ID No.
Fax No.	E-Mail Address
Number of calendar days delivery after receipt of order: _____	Payment Terms: _____ Note: Net 30 is default. Early pay discounts encouraged.
Select Payment Method: SUA ACH Check	
Circle one: Individual Partnership Corporation	
If a corporation, incorporated under the laws of the State of _____	
Licensed to do business in the State of Missouri? ___yes ___no	
Maintain a regular place of business in the State of Missouri? ___yes ___no	

This signature sheet must be returned with your bid.

BID REQUEST AND BID CONDITIONS

This Bid Request and Bid is made upon and subject to the following conditions, all of which are accepted by bidder. Upon acceptance by University, this Bid Request and Bid and the University Purchase Order issued thereon shall constitute the contract for furnishing the items described in the bid in strict conformity with the contract instruments.

- 1.** No oral explanation regarding the meaning of the specifications will be made, and no oral interpretation will be given before the award of the contract. If any person contemplating submitting a bid for this contract is in doubt as to the true meaning of any part of the specifications or any other proposed contract documents, they may submit to the University a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made by addendum duly issued or delivered to each person receiving a set of such documents. The University will not be responsible for any other explanation or interpretations of the proposed documents.
- 2.** The University reserves the right to reject any and all bids and to waive any informality in bids.
- 3.** Whenever the name of a manufacturer or vendor is mentioned herein and words "or equal" do not follow, it shall be deemed that the words "or equal" shall follow such designation unless the context specifies "no substitution". University assumes that items bid as equal are equal. University reserves the right to return at the bidder's expense all items that are furnished which are not acceptable as equals to items specified by the Bid Request and Specifications, and supplier agrees to replace such items with satisfactory items at the original bid price.
- 4.** Unless it is so noted on the bid it will be deemed that the article furnished is that designated. If the supplier proposes to furnish an item of a different manufacturer or supplier other than the one specified on the face hereof, the manufacturer or supplier of the substituted items shall be noted and complete descriptive literature describing the items to be substituted must accompany the bid.
- 5.** All items bid shall be new unless otherwise specified by the University.
- 6.** Bidder agrees to unconditionally guarantee all items bid upon against defects in material and workmanship for a period of one year from the date of acceptance by the University unless otherwise specified.
- 7.** Materials and services furnished the University are not subject to either Federal Excise Taxes or the Missouri Sales Tax. Exemption certificates will be furnished on request.
- 8.** Prices quoted are to be firm and final, and prices shall be stated in units of quantity specified with packing and drayage charges included.
- 9.** Shipments shall be marked as directed on the Purchase Order.
- 10.** All deliveries shall be made FOB Destination with freight charges fully included and prepaid. C.O.D. shipments will not be accepted. The seller must pay and bear all freight charges.
- 11.** The University will not be responsible for articles or services furnished without a Purchase Order.
- 12.** Risk of loss or damage to the goods prior to the time of their receipt and acceptance by the University is upon the supplier.
- 13.** All invoices and correspondence shall show the Purchase Order Number. All invoices must contain full descriptive information on items or service furnished. Separate invoices shall be rendered for each order and forwarded to the University.
- 14.** Supplier agrees to defend, protect, and save the University harmless from all claims and actions arising out of patent infringement.
- 15.** University reserves the right to cancel all or any part of orders if shipment is not made as promised. Supplier shall notify the University if shipment cannot be made as promised. Time of proposed delivery must be stated in definite terms in the space provided.
- 16.** The bidder hereby guarantees that no article listed herein is adulterated or misbranded within the meaning of the Federal Food, Drug and Cosmetic Act or an article which may not, under the provisions of Federal Law, be introduced into interstate commerce.
- 17.** Samples, when required, are to be furnished prior to the date specified for receipt of bids.
- 18.** In case of any doubt or difference of opinion as to the items to be furnished hereunder or the quality thereof, the decision of the UM Chief Procurement Officer shall be final and binding upon both parties.
- 19.** The University reserves the right to award an order to the lowest aggregate bidder for all items or on an item basis, or a group of like items, whichever is found to be in the best interest of the University. If a split award is not acceptable to a bidder, it must be stated in the bid response.

- 20.** In awarding the contract, the University may take into consideration the skill, facilities, capacity, experience, ability, responsibility, previous work, the financial standing of the bidder or bidders; the amount of other work being carried on by the bidder; the quality, efficiency, and construction of the equipment proposed to be furnished; the period of time within which the equipment is to be furnished and delivered; and the necessity of prompt delivery of the items herein described. The inability of any bidder to meet the requirement mentioned above may be cause for rejection of his bid.
- 21.** In the event time and materials are a portion of this bid, the University reserves the right to audit supplier's records concerning this bid.
- 22.** All items or services to be furnished hereunder shall meet all applicable State and Federal requirements of the Occupational Safety and Health Standard. All alleged violations and deviations from said State and Federal regulations or standards of the items of services to be furnished hereunder, must be set forth on the Bid Form at the time of submission of the bid. Or if at any later date the items or services contained herein shall not meet all applicable state and federal requirements after the bidder is awarded the contract hereunder, the bidder must notify UM Procurement immediately in writing.
- 23.** The University serves from time to time as contractor for the United States Government. Accordingly, the provider of goods and/or services shall comply with federal laws, rules, and regulations applicable to subcontractors of government contracts including those relating to equal employment opportunity and affirmative action in the employment of minorities (Executive Order 11246), women (Executive Order 11375), persons with disabilities (29 USC 706 and Executive Order 11758), and certain veterans (38 USC 4212 formerly [2012]) contracting with business concerns with small disadvantaged business concerns (Publication L. 95-507). Contract clauses required by the Government in such circumstances are incorporated herein by reference.
- 24.** As required by Section 508 of the Rehabilitation Act (36 C.F.R., Pt. 1194) and other state and federal laws, the University requires that all products provide equivalent ease of use for individuals with disabilities as for non-disabled individuals. To fulfill this obligations, Bidder shall: (1) ensure that all products comply with the Web Content Accessibility Guidelines (WCAG); (2) provide the University with an Accessibility Conformance Report; (3) respond promptly to accessibility complaints or reported deficiencies at no cost to the University; and (4) indemnify and hold the University harmless in the event of any claims arising from inaccessibility.
- 25.** Bidder certifies to the best of its knowledge and belief that it and its principals are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency in accordance with Executive Order 12549 (2/18/86).
- 26.** If this bid involves health care services or products, the Bidder agrees to maintain, and will further assure such compliance by its employees or subcontractors, the confidential nature of all information which may come to Bidder with regard to patients of the University. All services provided pursuant to this bid shall be provided in accordance with all applicable federal and state laws, including The Health Insurance Portability and Accountability Act of 1996, Public Law 104-191, sections 261-264, the Administrative Simplification sections and the regulations promulgated pursuant thereto and regulations of the Joint Commission on Administration. Bidder represents that Bidder is not currently excluded or threatened with exclusion from participating in any federal or state funded health care program, including Medicare and Medicaid. Bidder agrees to notify the University of any imposed exclusions or sanctions covered by this representation.
- 27.** If the contract resulting from this bid involves the acquisition of disposal of services, supplies, information technology, or construction and has a total potential value of \$100,000 or more, and if awarded supplier is a company with ten (10) or more employees, then Supplier certifies that it, and any company affiliated with it, does not boycott Israel and will not boycott Israel during the term of this Contract. In this paragraph, the terms "company" and "boycott Israel" shall have the meanings described in Section 34.600 of the Missouri Revised Statutes.
- 28.** Any contract issued as a result of this RFB shall be construed according to the laws of the State of Missouri. Additionally, the awarded supplier shall comply with all local, state, and federal laws and regulations related to the performance of the contract to the extent that the same may be applicable.
- 29.** In accordance with University policy, preference shall be given to Missouri products, materials, services, and firms when the goods or services to be provided are equally or better suited for the intended purpose. In assessing overall value, consideration will be given to the extent to which proximity or Missouri preference of the supplier provides potential advantages or reduction of risks. Firms are considered "Missouri firms" if they maintain a regular place of business in the State of Missouri.
- 30.** In connection with the furnishing of equipment, supplies, and/or services as a result of this bid, the contractor and all subcontractors shall agree not to discriminate against any recipients of services, or employees or applicants for

employment on the basis of race, color, religion, national origin, sex, age, disability or veteran status. The contractor shall comply with federal laws, rules, and regulations applicable to subcontractors of government contracts, including those relating to equal employment of minorities, women, persons with disabilities, and certain veterans. Contract clauses required by the United States Government in such circumstances are incorporated herein by reference.

- 31.** Due to the changing nature of the COVID-19 pandemic, awarded supplier will monitor and comply with CDC and other federal, state and local guidance; modifications to University operating procedures; and directives of University relating to protection of the health and safety of the University community.

NOTIFICATION TO UNIVERSITY IN EVENT OF POSITIVE COVID-19 CASE: In the event any of the successful Contractor's personnel who have or are presently performing services for the University of Missouri (a) tests positive for COVID-19, or (b) has been in close contact with someone that tests positive for COVID-19, the successful Contractor shall immediately notify the University designated contact, and take immediate action to quarantine such person and any other Contractor Personnel who may have come in contact with the person testing positive for COVID-19, and assist University in identifying any other persons on the University campus who may have come in contact with such person. Contractor must clean and disinfect all areas any infected person may have contacted on University's campus, and any cleaning or sanitation costs resulting from a positive COVID-19 test of Contractor personnel are the sole cost and responsibility of Contractor.
- 32.** Suppliers shall refrain in offering any offers of gifts to the University and all University of Missouri employees in accordance with University of Missouri Policy, #26301, Suppliers.
- 33.** The University reserves the right, in its best interest as determined by the University, to cancel the contract by giving written notice to the Supplier thirty (30) days prior to the effective date of such cancellation.
- 34.** Preferred settlement method is through the use of Electronic Accounts Payable solutions. Payment terms associated with these forms of payment will be issued as net 30 after the date of invoice. Payment terms associated with settlement by check will be net 30 days. Cash discounts for prompt payment may be offered but they will not be considered in determination of award unless specifically stated in the Detailed Specifications and Special Conditions. The University may withhold payment or make such deductions as may be necessary to protect the University from loss or damage on account of defective work, claims, damages, or to pay for repair or correction of equipment or supplies furnished hereunder. Payment may not be made until satisfactory delivery and acceptance by the University and receipt of correct invoice have occurred. For consulting services and/or contract labor services performed for MU Health Care, the hourly rate and the number of hours worked must be included in the agreement and/or on the invoice submitted. Payment may not occur unless this information has been provided. The University encourages suppliers to opt into its Single-Use Account (SUA) credit card program for payment of invoices. The SUA is an electronic, credit card-based paymentsolution that acts like a check. It provides a single 16-digit virtual account number for each payment. Similar to a check, the credit limit on each SUA is set to the specific payment amount. Payment terms for Suppliers who participate in the SUA program are Net 0 as opposed to the standard Net 30 terms. No additional fees shall be charged for the use of University credit cards.
- 35.** The intended coverage of this RFB, and any contract resulting from this solicitation, shall be for the use by all faculty, staff, students, departments, locations, and affiliates of the University of Missouri, including MU Health Care. The University of Missouri System seeks to make the terms and prices of this bid available to other public entities and higher education institutions. Extension of the terms and prices to any or all other higher education institutions and public entities is at the discretion of bidders and shall not be considered in the award of this bid. The bidder shall further understand and agree that participation by other higher education institutions and public entities is discretionary on the part of these institutions, and the University of Missouri System bears no financial responsibility for any payments due the supplier by such entities, nor will the University be responsible for contract administration other institutions.

**UNIVERSITY OF MISSOURI
SPECIAL CONDITIONS & DETAILED SPECIFICATIONS**

University of Missouri Procurement is requesting bids for the furnishing and delivery of one (1) **3 PHASE 15kV 6-WAY SWITCHGEAR** for University of Missouri – Columbia Campus / Energy Management. **THERE WILL BE NO INSTALLATION REQUIRED**

All quantities are estimated based upon anticipated needs. The University reserves the right to order more or less as needed. Instructions for ordering will be provided at time of notice of award and/or issuance of purchase order.

AWARD:

The award will be based on lowest bid meeting all specifications. The University reserves the right to award an order to the lowest aggregate bidder for all items or on an item basis, or a group of like items, whichever is found to be in the best interest of the University. **If a split award is not acceptable to a bidder, it must be stated in the bid response.**

Note: The University of Missouri reserves the right to negotiate best and final terms with the bidder selected.

INSURANCE REQUIREMENTS:

Contractor agrees to maintain, on a primary basis and at its sole expense, at all times during the life of any resulting contract the following insurance coverages, limits, including endorsements described herein. The requirements contained herein, as well as the University's review or acceptance of insurance maintained by Contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by Contractor under any resulting contract. Coverage to be provided as follows by a carrier with A.M. Best minimum rating of A- VIII.

Commercial General Liability - Contractor agrees to maintain Commercial General Liability at a limit of not less than \$1,000,000 Each Occurrence, \$2,000,000 Annual Aggregate. Coverage shall not contain any endorsement(s) excluding nor limiting Product/Completed Operations, Contractual Liability or Cross Liability.

Contractor may satisfy the minimum liability limits required for Commercial General Liability or Business Auto Liability under an Umbrella or Excess Liability policy. There is no minimum per occurrence limit of liability under the Umbrella or Excess Liability; however, the Annual Aggregate limit shall not be less than the highest "Each Occurrence" limit for either Commercial General Liability or Business Auto Liability. Contractor agrees to endorse The Curators of the University of Missouri, its officers, employees and agents as Additional Insured on the Umbrella or Excess Liability, unless the Certificate of Insurance state the Umbrella or Excess Liability provides coverage on a "Follow-Form" basis.

Business Auto Liability (If required in service performance) - Contractor agrees to maintain Business Automobile Liability at a limit not less than \$1,000,000 Each Occurrence. Coverage shall include liability for Owned, Non-Owned & Hired automobiles. In the event Contractor does not own automobiles, Contractor agrees to maintain coverage for Hired & Non-Owned Auto Liability, which may be satisfied

by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Workers' Compensation & Employers Liability Contractor agrees to maintain Workers' Compensation in accordance with Missouri State Statutes or provide evidence of monopolistic state coverage. Employers Liability with the following limits: \$500,000 each accident, disease each employee and disease policy limit.

Contract Language - The Curators of the University of Missouri, its officers, employees and agents are to be Additional Insured with respect to the project to which these insurance requirements pertain. A certificate of insurance evidencing all coverage required is to be provided at least 10 days prior to the inception date of the contract between the contractor and the University. Contractor/Party is required to maintain coverages as stated and required to provide written notice of cancellation according to the policy provisions. The University reserves the right to request a copy of the policy. The University reserves the right to require higher limits on any contract provided notice of such requirement is stated in the request for proposals for such contract.

Indemnification - The Contractor agrees to defend, indemnify, and save harmless The Curators of the University of Missouri, their Officers, Agents, Employees and Volunteers, from and against all loss or expense from any cause of action arising from the Contractor's operations. The contractor agrees to investigate, handle, respond to and provide defense for and defend against any such liability, claims, and demands at the sole expense of the Contractor or at the option of the University, agrees to pay to or reimburse the University for the Defense Costs incurred by the University in connection with any such liability claims, or demands.

The parties hereto understand and agree that the University is relying on, and does not waive or intend to waive by any provision of this Contract, any monetary limitations or any other rights, immunities, and protections provided by the State of Missouri, as from time to time amended, or otherwise available to the University, or its officers, employees, agents or volunteers.

Failure to maintain the required insurance in force may be cause for contract termination. In the event the Agency/Service fails to maintain and keep in force the required insurance or to obtain coverage from its subcontractors, the University shall have the right to cancel and terminate the contract without notice.

The insurance required by the provisions of this article is required in the public interest and the University does not assume any liability for acts of the Agency/Service and/or their employees and/or their subcontractors in the performance of this contract.

DETAILED SPECIFICATIONS (The following are minimum specifications.):

Part 1 General

- 1.1 The switchgear shall be in accordance with the attached one-line diagram, and shall conform to the following specification.
- 1.2 The switchgear shall consist of a gas-tight tank containing SF6 gas, load-interrupter switches and resettable fault interrupters with visible open gaps and integral visible grounds, **with auxiliary contacts** and a microprocessor-based overcurrent control. Load-interrupter switch terminals shall be equipped with bushings rated 600 amperes continuous, and fault-interrupter terminals shall be equipped with bushings rated 600 amperes continuous to provide for elbow connection. Manual operating mechanisms and viewing windows shall be located on the opposite side of the tank from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.
- 1.3 Each three-phase load-interrupter and each three-phase fault-interrupter will be reference to as a “way”.
- 1.4 The ratings for the integrated switchgear shall be as designated below.

Frequency:	60 Hz
Short-Circuit Rating, RMS Symmetrical:	25,000 Amperes
kV, Maximum:	15.5kV
kV, BIL :	95kV
Main Bus Continuous, Amperes:	600
Three-Pole Load-Interrupter Switches:	
Continuous, Amperes	600
Load Dropping, Amperes	600
Fault-Closing, Duty-Cycle	
Three-Time, Amperes RMS Symmetrical	25,000
Three-Time, Amperes, Peak	65,000
10-Time, Amperes RMS Symmetrical	12,000
10-Time, Amperes, Peak	32,500
Fault Interrupters	
Continuous, Amperes	600
Load Dropping, Amperes	600
Fault Interrupting, Duty-Cycle	
Three-Time, Amperes RMS Symmetrical	25,000
Ten-Time, Amperes RMS Symmetrical	12,500
Fault-Closing, Duty-Cycle	
Three-Time, Amperes RMS Symmetrical	25,000
Three-Time, Amperes, Peak.	65,000
10-Time, Amperes RMS Symmetrical	12,500
10-Time, Amperes, Peak	32,500

1.5 Certification of Ratings

- 1.5.1 The manufacturer of the switchgear shall be completely and solely responsible for the performance of the load-interrupter switch and fault interrupter as well as the complete integrated assembly as rated.
- 1.5.2 The manufacturer shall furnish, upon request, certification of ratings of the load-interrupter switch, fault interrupter, and the integrated switchgear assembly consisting of switches and fault interrupters in combination with the gas-tight tank.

1.6 Compliance with Standards and Codes

The switchgear shall conform to or exceed the applicable requirements of the following standards and codes:

- 1.6.1 The applicable portions of ANSI C57.12.28, covering enclosure integrity for padmounted equipment.
- 1.6.2 The applicable portions of ANSI C37.71, ANSI C37.72, ANSI C37.73, IEC 56, and IEC 265-1 (Class A), which specify test procedures and sequences for the load-interrupter switches, fault interrupters, and the complete switchgear assembly.
- 1.6.3 The applicable portions of IEC 298, Appendix AA covering arc resistance, through 25 kA for 15 cycles.

Part 2 Construction

2.1 SF6 - Gas Insulation

- 2.1.1 The SF6 gas shall conform to ASTM D2472.
- 2.1.2 The switchgear shall be filled with SF6 gas to a pressure of 7 psig at 68°F.
- 2.1.3 The gas-tight tank shall be evacuated prior to filling with SF6 gas to minimize moisture in the tank.
- 2.1.4 The switchgear shall withstand system voltage at a gas pressure of 0 psig at 68° F.
- 2.1.5 A gas-fill valve shall be provided.
- 2.1.6 A temperature-compensated pressure gauge shall be provided that is color coded to show the operating range. The gauge shall be mounted inside the gas-tight tank (visible through a large viewing window) to provide consistent pressure readings regardless of the altitude at the installation site.

2.2 Gas-Tight Tank

- 2.2.1 The tank shall be submersible and able to withstand up to 10 feet of water over the base.
- 2.2.2 The tank shall be of welded construction and shall be made of stainless steel.
- 2.2.3 A means of lifting the tank shall be provided.
- 2.2.4 Auxiliary contact for remote low-pressure alarm with wires routed to terminal blocks mounted in an enclosure for customer connection.**

2.3 Viewing Windows

- 2.3.1 Each load-interrupter switch shall be provided with a large viewing window at least 6 inches by 12 inches to allow visual verification of the switch-blade position (open, closed, and grounded) while shining a flashlight on the blades.
- 2.3.2 Each fault interrupter shall be provided with a large viewing window at least 6 inches by 12 inches to allow visual verification of the disconnect-blade position (open, closed, and grounded) while shining a flashlight on the blades.
- 2.3.3 Viewing windows shall be located on the opposite side of the gear from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.

2.4 High-Voltage Bus

- 2.4.1 Bus and interconnections shall withstand the stresses associated with short-circuit currents up through the maximum rating of the switchgear.
- 2.4.2 Before installation of aluminum bus, all electrical contact surfaces shall first be prepared by machine abrading to remove any oxide film. Immediately after this operation, the electrical contact surfaces shall be coated with a uniform coating of an oxide inhibitor and sealant.

2.5 Provisions for Grounding

- 2.5.1 One ground-connection pad per way shall be provided on the gas-tight tank of the switchgear.
- 2.5.2 The ground-connection pad shall be constructed of stainless steel and welded to the gas-tight tank, and shall have a short-circuit rating equal to that of the switchgear.
- 2.5.3 One enclosure ground pad shall be provided.

2.6 Terminations

- 2.6.1 Terminals for load-interrupter switches and fault interrupters shall have 600-ampere bushings for non-load break, bolted elbow connection.
- 2.6.2 Bushings and bushing wells shall be located on one side of the gear to reduce the required operating clearance.
- 2.6.3 Bushings rated 600 amperes continuous shall be provided *Without* a threaded stud.

2.87 Bushings and Bushing Wells

- 2.7.1 Bushings and bushing wells shall conform to ANSI/IEEE Standard 386 (ANSI Standard C119.2).
- 2.7.2 Bushings and bushing wells shall include a semiconductive coating.
- 2.7.3 Bushings and bushing wells shall be mounted in such a way that the semiconductive coating is solidly grounded to the gas-tight tank.

Part 3 Basic Components

3.1 Load-Interrupter Switches

- 3.1.1 The three-phase, gang-operated load-interrupter switches shall have a three-time and ten-time duty-cycle fault-closing rating as specified under section 1.4. Certified test abstracts establishing such ratings shall be furnished upon request.
- 3.1.2 The switch shall be provided with an integral ground position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to ground the equipment. The switch blade ends must be highly visible to easily indicate the switch position (closed/open/grounded) during low lighting conditions.
- 3.1.3 The ground position shall have a three-time and ten-time duty-cycle fault-closing rating as specified in section 1.4.
- 3.1.4 The switch shall be provided with an open position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to establish a visible gap.
- 3.1.5 The open gaps of the switch shall be sized to allow cable testing through a feedthru bushing or the back of the elbow.
- 3.1.6 **Auxiliary contacts shall be included to provide verification of Closed/Open/Grounded blade position with wires routed to terminal blocks mounted in an enclosure for customer connection.**

3.2 Fault Interrupters

- 3.2.1 Fault interrupters shall have a three-time and ten-time duty-cycle fault-closing and fault interrupting rating as specified under section 1.4. Certified test abstracts establishing such ratings shall be furnished upon request.
- 3.2.2 The fault interrupter shall be provided with a disconnect with an integral ground position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to ground the equipment. The switch blade ends must be highly visible to easily indicate the switch position (closed/open/grounded) during low lighting conditions.
- 3.2.3 The ground position shall have a three-time and ten-time duty-cycle fault-closing rating as specified in section 1.4.
- 3.2.4 The disconnect shall be provided with an open position that is readily visible through the viewing window, eliminating the need for cable handling and exposure to high voltage to establish a visible gap.
- 3.2.5 The fault interrupter, including its three-position disconnect, shall be a single integrated design so that operation between the closed and open positions or the open and grounded positions is accomplished with a single, intuitive movement.
- 3.2.6 The open gaps of the disconnect shall be sized to allow Hi-Pot testing through the bushing.
- 3.2.7 An internal indicator shall be provided for each fault interrupter to show when it is in the tripped condition. The indicator shall be clearly visible through the viewing window.
- 3.2.8 **Auxiliary contacts shall be included to provide verification of Closed/Open/Grounded blade position as well as trip indication of fault interrupter with wires routed to terminal blocks mounted in an enclosure for customer connection.**

3.3 Operating Mechanisms

- 3.3.1 Load-interrupter switches and fault interrupters shall be operated by means of a quick-make, quick-break mechanism.
- 3.3.2 The manual handle shall charge the operating mechanism for opening, closing, and grounding of the switches and fault interrupters.
- 3.3.3 A single, integrated operating mechanism shall fully operate each fault interrupter or load interrupter switch in a continuous movement, so that additional operations are not required to establish open or ground positions.
- 3.3.4 Operating mechanisms shall be equipped with an operation selector to prevent inadvertent operation from the closed position directly to the grounded position, or from

the grounded position directly to the closed position. The operation selector shall require physical movement to the proper position to permit the next operation.

- 3.3.5 Operating shafts shall be padlockable in any position to prevent operation.
- 3.3.6 The operation selector shall be padlockable to prevent operation to the grounded position.
- 3.3.7 The operating mechanism shall indicate switch position which shall be clearly visible from the normal operating position.

3.4 Overcurrent Control

- 3.4.1 A microprocessor-based overcurrent control shall be provided to initiate fault interruption.
- 3.4.2 **External trip provisions shall be provided for each fault interrupter way to allow three-pole tripping via owner provided trip signal using 110/120-Vac 50/60Hz control power source.**
- 3.4.2 The control shall be mounted in an enclosure and shall be removable in the field without taking the gear out of service.
- 3.4.3 Control settings shall be field programmable using a personal computer connected via a data port to the control. The data port shall be accessible from the exterior of the enclosure. Neither external power nor energization of the gear shall be required to set or alter control settings.
- 3.4.4 Power and sensing for the control shall be supplied by integral current transformers.
- 3.4.5 The minimum total clearing time (from initiation of the fault to total clearing) for fault interruption shall be 40 milliseconds (2.4 cycles) at 60 hertz.
- 3.4.6 The control shall provide time-current characteristic (TCC) curves including standard E-speed, K-speed, coordinating-speed tap, coordinating-speed main curves, and relay curves per IEEE C37.112- 1996. Coordinating-speed tap curves shall optimize coordination with load-side weak-link/backup current-limiting fuse combinations, and coordinating-speed main curves shall optimize coordination with tap-interrupter curves and upstream feeder breakers.
- 3.4.7 The standard E-speed curve shall have phase-overcurrent settings ranging from 25E through 400E. The coordinating-speed tap curve shall have phase-overcurrent and independent ground-overcurrent settings ranging from 50 amperes through 400 amperes. The coordinating-speed main curve shall have phase-overcurrent and independent ground-overcurrent settings ranging from 100 amperes through 800 amperes.

3.4.8 The time-overcurrent relay curves conform to IEEE C37.112-1996 IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays for the following curves:

U.S. Moderately Inverse Curve U1, U.S. Inverse Curve U2, U.S. Very Inverse Curve U3, U.S. Extremely Inverse Curve U4, U.S. Short-Time Inverse Curve U5, I.E.C. Class A Curve (Standard Inverse) C1, I.E.C. Class B Curve (Very Inverse) C2, I.E.C. Class C Curve (Extremely Inverse) C3, I.E.C. Long-Time Inverse Curve C4, and I.E.C.Short-Time Inverse Curve C5.

3.4.9 The control shall have instantaneous-trip (1 kA through 8 kA) and definite-time delay (32 ms through 96 ms) settings to allow tailoring of the coordinating-speed tap and coordinating-speed main curves to the application.

3.4.10 Event records shall be easily extractable from the control using a personal computer connected to the data port.

3.4.11 The control shall store sufficient energy to operate the motor operators for the interrupter switches without impacting the accuracy or coordination under fault conditions.

3.5 Voltage indication with provisions for low-voltage phasing

3.5.1 Voltage indication with provisions for low-voltage phasing for each load-interrupter switch and fault interrupter, shall be provided by means of capacitive taps on the bushings. There shall be no need for cable handling and exposure to high voltage to test the cables for voltage and phasing. This feature shall include a flashing LCD display to indicate the presence of voltage for each phase, and a solar panel to supply power for testing of the complete voltage-indication circuit and phasing circuit.

3.5.2 The voltage-indication feature shall be mounted on the opposite side of the gear from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.

Part 4 Switchgear Style

4.1 Pad-Mounted Style

4.1.1 The gas-tight tank shall be made of stainless steel as specified in section 2.2.

4.1.2 Enclosure

(a) The switchgear shall be provided with a pad-mounted enclosure suitable for installation of the gear on a concrete pad.

- (b) The pad-mounted enclosure shall be separable from the switchgear to allow clear access to the bushings and bushing wells for cable termination.
- (c) The basic material shall be 14-gauge hot-rolled, pickled, and oiled steel sheet.
- (d) The enclosure shall be provided with removable front and back panels, and hinged lift-up roof sections for access to the operating and termination compartments. Each roof section shall have a retainer to hold it in the open position.
- (e) Lift-up roof sections shall overlap the panels and shall have provisions for padlocking that incorporate a means to protect the padlock shackle from tampering.
- (f) Lift-up roof sections shall slope to prevent pooling or collecting water when in the closed or normal position.
- (g) Penta-head bolts shall be used to limit all entry to enclosure.
- (h) The base shall consist of continuous 90-degree flanges, turned inward and welded at the corners, for bolting to the concrete pad.
- (i) Panel openings shall have 90-degree flanges, facing outward, that shall provide strength and rigidity as well as deep overlapping between panels and panel openings to guard against water entry.
- (j) For bushings rated 600 amperes continuous, the termination compartment shall be of an adequate depth to accommodate encapsulated surge arresters mounted on 600-ampere elbows having 200-ampere interfaces.
- (k) An instruction manual holder shall be provided.
- (l) Non-removable lifting tabs shall be provided.

4.1.3 Enclosure Finish

- (a) All exterior welded seams shall be filled and sanded smooth for neat appearance.
- (b) To remove oils and dirt, to form a chemically and anodically neutral conversion coating to improve the finish-to-metal bond, and to retard underfilm propagation of corrosion, all surfaces shall undergo a thorough pretreatment process comprised of a fully automated system of cleaning, rinsing, phosphatizing, sealing, drying, and cooling, before any protective coatings are applied. By utilizing an automated pretreatment process, the enclosure shall receive a highly consistent thorough treatment, eliminating fluctuations in reaction time, reaction temperature, and chemical concentrations.

- (c) After pretreatment, protective coatings shall be applied that shall help resist corrosion and protect the steel enclosure. To establish the capability to resist corrosion and protect the enclosure, representative test specimens coated by the manufacturer's finishing system shall satisfactorily pass the following tests:
- (i) 4000 hours of exposure to salt-spray testing per ASTM B 117 with:
 - (1) Underfilm corrosion not to extend more than 1/32" from the scribe as evaluated per ASTM D 1645, Procedure A, Method 2 (scraping); and
 - (2) Loss of adhesion from bare metal not to extend more than 1/8" from the scribe.
 - (ii) 1000 hours of humidity testing per ASTM D 4585 using the Cleveland Condensing Type Humidity Cabinet with no blistering as evaluated per ASTM D 714.
 - (iii) 500 hours of accelerated weathering testing per ASTM G 53 using lamp UVB-313 with no chalking as evaluated per ASTM D 659, and no more than 10% reduction of gloss as evaluated per ASTM D 523.
 - (iv) Crosshatch adhesion testing per ASTM D 3359 Method B with no loss of finish.
 - (v) 160-inch-pound impact adhesion testing per ASTM D 2794 with no chipping or cracking.
 - (vi) Oil resistance testing consisting of a 72-hour immersion bath in mineral oil with no shift in color, no streaking, no blistering, and no loss of hardness.
 - (vii) 3000 cycles of abrasion testing per ASTM 4060 with no penetration to the substrate. Certified test abstracts substantiating the above capabilities shall be furnished upon request.
- (d) The finish shall be inspected for scuffs and scratches. Blemishes shall be touched up by hand to restore the protective integrity of the finish.
- (e) The finish shall be olive green, Munsell 7GY3.29/1.5. One can of touch-up paint shall be provided for each unit provided.

Part 5 Labeling

5.1 Hazard-Alerting Signs

- 5.1.1 The exterior of the pad-mounted enclosure (if furnished) shall be provided with **"Warning—Keep Out—Hazardous Voltage Inside—Can Shock, Burn, or Cause Death"** signs.

5.1.2 Switchgear shall be provided with a “Danger—Hazardous Voltage—Failure to Follow These Instructions Will Likely Cause Shock, Burns, or Death” sign. The text shall further indicate that operating personnel must know and obey the employer’s work rules, know the hazards involved, and use proper protective equipment and tools to work on this equipment.

5.1.3 Switchgear shall be provided with a “Danger—Keep Away—Hazardous Voltage—Will Shock, Burn, or Cause Death” sign.

5.2 Nameplates, Ratings Labels, and Connection Diagrams

5.2.1 Switchgear shall be provided with a nameplate indicating the manufacturer’s name, catalog number, model number, date of manufacture, and serial number.

5.2.2 Switchgear shall be provided with a ratings label indicating the following:

voltage rating; main bus continuous rating; short-circuit rating; fault-interrupter ratings including interrupting and duty-cycle fault-closing; and load-interrupter switch ratings including duty-cycle fault-closing and short-time.

5.2.3 The pad-mounted enclosure shall be provided with a connection diagram showing load-interrupter switches, fault interrupters with integral disconnects, and bus along with the manufacturer’s model number.

Part 6 Testing Requirements

6.1 A certified third party independent test report shall be submitted if requested. This report shall include, but is not limited to, Short Time Current, Momentary and 1 Second. Unit shall be tested in accordance with the appropriate sections on ANSI C37.34-1971, “American National Test Code for High-Voltage Air Switches”.

Part 7 Shipping

7.1 Shipping shall be F.O.B. University of Missouri-Columbia, Energy Management. Receiving by the University shall be during normal business hours Monday – Friday, 8:00 am to 3:00 pm. Notice shall be given 48 hours prior to arrival to allow arrangements to be made for receiving. **Notice shall be given to Energy Management Electric Distribution Supervisor by calling (573) 882-3094 at least 48 hours prior to arrival on site.**

BY CHECKING THIS BOX THE BIDDER ACKNOWLEDGES ALL SPECIFICATIONS CAN BE MET AND ALL REQUESTED INFORMATION PERTAINING TO QUALIFICATIONS IS ACCURATE.

PRICING:

NAME BRAND - _____

MODEL NUMBER - _____

LEAD TIME - _____

DELIVERED PRICE - \$ _____

**ATTACHMENT A
SUPPLIER DIVERSITY PARTICIPATION FORM**

The University of Missouri System is committed to and supports supplier diversity as an essential part of the University’s mission and core values. The University’s Supplier Diversity efforts reflect this mission.

Tier 2 Supplier Diversity Information - The University strongly encourages Supplier Diversity participation in all of its contracts for goods and services. Tier 2 Spend is spend reported by primary (non-diverse) suppliers of the University of Missouri who subcontract work to or make purchases from a diverse supplier. Depending upon the contract, primary (non-diverse) suppliers will be asked to submit Tier 2 information with Minority and Diverse Owned companies. Suppliers have two options in reporting Tier 2 dollars depending on the terms of the contract: Direct and Indirect.

- Direct dollars - those dollars directly spent with Women and Diverse Owned suppliers in the fulfillment of the contract.
- Indirect dollars - based on a percentage of revenue the University represents to the supplier. An example is as follows:
 1. Supplier's Total Revenues: \$10,000,000
 2. Revenues from University \$: \$ 4,000,000
 3. University % of Total Revenues: 40% (#2 divided by #1)
 4. Total Minority and Diverse owned Dollars \$: \$ 400,000
 5. University % Attributable Revenue: 1% (#4 divided by #2)

1. Does your company have a Supplier Diversity Program? If so, describe efforts your company has made to increase business with Minority and Diverse Owned businesses (i.e. does your company have a policy statement, participate in outreach activities, promote diverse subcontracting, publicize bid opportunities, provide certification assistance, etc.?) Provide examples (use additional pages if needed):

2. If you are a non-diverse owned company, what percentage of your company's total contracting and procurement spend for the prior year was with Minority and Diverse Owned businesses? _____
Are you able to provide this information specific to University of Missouri business? _____

3. If you are a non-diverse owned company, complete the following table indicating the percentage your company will subcontract with certified Women and Diverse Owned businesses should your company be the successful bidder. Note: If your company does not plan to use Women and Diverse Owned businesses to fulfill your contract obligations, please explain why not.

Supplier Name	% of Contract	Specify Direct or Indirect

If there are questions regarding supplier diversity at the University, contact Teresa Vest, vestt@umsystem.edu.

**ATTACHMENT B
SUPPLIER REGISTRATION INFORMATION**

Completion of this section is strongly encouraged. Please review and check ALL applicable boxes.

SMALL BUSINESS CONCERN: Yes No

NOTE: The term "small business concern" shall mean a business as defined pursuant to Section 3 of the Small Business Act and relevant regulations issued pursuant thereto. Generally, this means a small business concern organized for profit, which is independently owned and operated, is not dominant in the field of operations in which it is bidding. We would consider any firm with 500 employees or less a "small business concern".

WOMAN OWNED BUSINESS (WBE): Yes No

NOTE: A woman owned business is defined as an organization that is 51% owned, controlled and/or managed, by a woman. The determination of WBE status depends solely on ownership and operation and is not related to employment. The firm should be certified by a recognized agency (e.g., state, local, federal, etc.). Please see Public Law 106-554 for more detail.

MINORITY BUSINESS ENTERPRISE (MBE): Yes No

NOTE: A minority business is defined as an organization that is 51% owned, controlled and/or managed by minority group members. The determination of minority status depends solely on ownership and operation and is not related to employment. The firm should be certified by a recognized agency (e.g., state, local, federal, etc.). Please see Public Law 95-507 for more detail. Place an X by the appropriate space below.

Asian-Indian - A U.S. citizen whose origins are from India, Pakistan and Bangladesh

Asian-Pacific - A U.S. citizen whose origins are from Japan, China, Indonesia, Malaysia, Taiwan, Korea, Vietnam, Laos, Cambodia, the Philippines, Thailand, Samoa, Guam, the U.S. Trust Territories of the Pacific or the Northern Marianas.

Black - A U.S. citizen having origins in any of the Black racial groups of Africa.

Hispanic - A U.S. citizen of true-born Hispanic heritage, from any of the Spanish-speaking areas Mexico, Central America, South America and the Caribbean Basin only.

Native American - A person who is an American Indian, Eskimo, Aleut or Native Hawaiian, and regarded as such by the community of which the person claims to be a part.

VETERAN BUSINESS ENTERPRISE Yes No

SERVICE-DISABLED VETERAN BUSINESS ENTERPRISE Yes No

NOTE: A Veteran or Service-Disabled Veteran business is defined as an organization that is 51% owned, controlled and/or managed by Veterans. The firm should be certified by a recognized agency (e.g., state, local, federal, etc.). Please see Public Law 109-461 for more detail.

MISSOURI FIRM: Yes No

NOTE: A Missouri Firm is defined as an organization which has and maintains within the State of Missouri a regular place of business for the transaction of their business.

SUPPLIER'S CERTIFICATION:

The undersigned hereby certifies that the foregoing information is a true and correct statement of the facts and agrees to abide by the laws of the State of Missouri and the rules and regulations of the University of Missouri System now in effect, including any subsequent revisions thereof. Supplier acknowledges that it is his/her responsibility to keep the information current by notifying the University of Missouri of any changes.

Signature of Person Authorized to Sign this Form: _____

Title: _____ Date: _____