

***BBGS B50 89MD B51, B52, B53 89SS
REPLACEMENT SPECIFICATION***



Building Community.

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SWITCH SPECIFICATIONS

1.0. GENERAL

1.1. Work Included

- 1.1.1. The bidder shall furnish and design customized controls for six 89MD switches and three 89SS switches to provide starting power to the generator stator during the static start sequence for three combustion turbine generators. The bidder shall assist with Installation, Commission and provide detailed report for the commissioning.
- 1.1.2. The following shall be furnished along with the equipment:
 - 1.1.2.1. Commissioning Testing Documentation
 - 1.1.2.2. Protective Shipping Packaging
 - 1.1.2.3. Operation and Maintenance Documentation
- 1.1.3. Unless noted otherwise, the design, fabrication, testing, and performance of the system shall be in accordance with the latest revisions of industry standards and codes, where applicable.
- 1.1.4. Our proposed outage for this work will be between March.10 through April.20 of 2027.
- 1.1.5. One week will be allowed to complete the project. Exact dates for work TBD.
- 1.1.6. The electrical contractor shall provide all materials and equipment.
- 1.1.7. The switch manufacturer shall provide engineering services for controls and on site TA assistance.

1.2. Related Work

- 1.2.1. The 89MD & 89SS Switches shall be installed by an Electrical Contractor in accordance with the manufacturer's recommendations and requirements.
- 1.2.2. All existing conduits shall be reused. None of the power feeders or bus bar is expected to be replaced.
- 1.2.3. Contractor shall make all field power and control wiring terminations per manufacturer's recommendations.
- 1.2.4. If required, the Electrical Contractor shall run new control wiring from the switch cabinets to the MKVIe cabinet to receive open close commands and to indicate state of switch.
- 1.2.5. If required, JEA shall make DCS wiring connections, DCS alarm logic and PI integration for any additional alarm inputs from the switch cabinets.
- 1.2.6. The manufacturer shall Commission each switch and provide a formal written report.
- 1.2.7. The manufacturer shall provide training during Commission for up to three JEA employees.
- 1.2.8. The commands and indications shall be tested during Commissioning to ensure that the appropriate signal is shown in the Control Room.

1.3. Switch Description

- 1.3.1. The B51, B52 & B53 89SS (3) existing switches are 23kV, 125kV BIL, 61kA Momentary, right hand operated, interrupter switches with cycloaliphatic epoxy push rods. The original OEM is Powercon Corp and the prime contractor for the enclosure (housing) is GE. The original drawings shall be provided to contractor and were verified to be correct in the field. There will be modifications expected to make the new switches fit. An electrical contractor shall install this equipment but it is expected that the switch manufacturer shall be on site assisting as a technical advisor, measuring strike distances, clearances and operation for the switch. The B50 89MD (6) Switches are very similar to the 89SS switches, however, they are mounted in enclosures manufactured by Powercon and the enclosure is indoors, inside of a shared services electrical room.
- 1.3.2. The new switches shall be standard three-phase blades, rated at a minimum of 1200A, and made of two silver plated copper stationary contacts with contact fingers. Drawings of the existing enclosures, switches, and controls shall be provided by JEA. None of the bus bars, power feeder cables, or control wiring is expected to be replaced. It is the request of JEA that the controls for the new switch match that of the existing switches. The Electrical Contractor shall make modifications to the existing

structure by welding, drilling, bolting or cutting existing metal so that the new switches can be installed. The open and close indication shall be driven by limit switches wired to electrical relays from which 12 open and 12 closed aux contacts are provided.

- 1.3.3. The switches have a kirk-key style mechanical interlock system both systems will prevent remote operation when locked in the field. Each kirk style lock shall be replaced with a Kirk-Key or kirk style equivalent with microswitch where it is electrically actuated.

1.4. System Operation

1.4.1. Switch Operation:

- 1.4.1.1 Normal - The switches are normally open waiting for a close command. The open command is 125VDC and the switch has a dry contact that closes to send 125VDC back to the control system to indicate that the switch is open.
- 1.4.1.2 Closed - The switches are closed while the units are being started. The closed command is 125VDC and the switch has a dry contact that closes to send 125VDC back to the control system to indicate that the switch is closed.
- 1.4.1.3 The switches shall be motor operated with motor rated at 120VAC and 12A max.
- 1.4.1.4 The mechanical interlocks for the SS switches have a lock for the main enclosure and for the handle cabinet for manual operation. The lock for the handle is electrically interlocked and shall be kept the same per the drawings. The purpose of the interlock is to keep personnel from operating the switch manually with the handle. The 89MD interlocks are very similar but interlock with the adjacent cabinets as well. The interlock function is to be kept identical for both systems. The switch manufacturer shall provide engineering support to duplicate this function and to replace the locks.

1.5. Quality Assurance

- 1.5.1. The manufacturer shall have an ISO 9001 – 2015 Quality Assurance Program with checks on incoming parts, modular assemblies, and final products. A final test procedure for the product shall include a check of all performance specifications. An on-site test procedure shall include a check of system functional operation after installation of the equipment.

1.6. Applicable Standards, Codes and Regulations

- 1.6.1. Institute of Electrical and Electronic Engineers (IEEE) C37.20.4 Indoor AC Medium Voltage Switches.

1.7. Submittals

- 1.7.1. With Proposals - Catalog cuts and/or data sheets describing the proposed equipment shall be submitted with the proposal. A user's listing shall be furnished giving company names, locations and 89SS or 89MD installed. **All deviations to this specification shall be listed and included with the proposal.**
- 1.7.2. After Receipt of Order - A minimum of two sets of installation drawings showing outline dimensions, weights, connections and a schematic diagram of the switches shall be sent to the purchaser to be used in planning the installation of the system.
- 1.7.3. After Construction of Equipment.
 - 1.7.3.1. Two copies of drawings shall be furnished for each of the following:
 - a. Equipment installation outline including external cabling termination locations.
 - b. Equipment internal wiring diagram.
 - 1.7.3.2. Two instruction manuals shall be furnished and shall include as a minimum the following:
 - a. Safety instructions
 - b. System description, specifications and controls
 - c. Installation planning
 - d. Operators guide
 - e. Control References for Each Function
 - f. Warranty and service information

1.7.3.3. At least one certified copy of the final electrical test report shall be furnished with the equipment.

1.7.4. After Installation of Equipment - A signed field service report describing start-up and on-site testing shall be furnished with the invoice for the service trip.

1.8. Delivery, Storage and Handling

1.8.1. The equipment shall be shipped on a wooden type pallet suitable for forklift handling. The equipment shall be covered with clear plastic sheeting to prevent dust and dirt from entering the cabinets during shipment and storage. The corners of the equipment shall be lined with card board so that any banding or wrapping will not score the paint or bend any metal. The contractor shall take full responsibility for the condition of the equipment during shipping.

1.9. Site Conditions

1.9.1. The equipment shall be suitable for installation inside an outdoor cabinet with ambient temperatures from 0 - 40° C (32 - 104° F).

1.10. Warranty

1.10.1. The manufacturer shall state their warranty of the equipment. In no case shall it be less than 12 months after start-up or 18 months after shipment, whichever occurs first.

2.0. PRODUCTS

2.1. 89MD Switches

2.1.1. 89MD Switch Electrical Requirements:

- 2.1.1.1. Voltage: 6.6kVAC.
- 2.1.1.2. Current: 1200A.
- 2.1.1.3. BIL: 95kV
- 2.1.1.4. 60kA SC
- 2.1.1.5. 60Hz
- 2.1.1.6. 3 Ph

2.1.2. 89MD Switch Arrangement:

- 2.1.2.1. Vertically mounted – Bus bar above, cables below.
- 2.1.2.2. Hole spacing – will need to be fit.
- 2.1.2.3. Approximately, twelve inch spacing between phases.

2.1.3. 89MD Switch Motor:

- 2.1.3.1 125VDC
- 2.1.3.2 5A

2.2. 89SS Switches

2.2.1. 89SS Switch Electrical Requirements:

- 2.2.1.1. Voltage: 15kVAC.
- 2.2.1.2. Current: 1200A.
- 2.2.1.3. BIL: 110kV
- 2.2.1.4. 60kA SC
- 2.2.1.5. 60Hz
- 2.2.1.6. 3 Ph

2.2.2. 89SS Switch Arrangement:

- 2.2.2.1. Vertically mounted – Bus bar above, cables below.
- 2.2.2.2. Hole spacing – will need to be fit.
- 2.2.2.3. Approximately, twelve inch spacing between phases.

- 2.2.3. 89SS Switch Motor
 - 2.2.3.1 125 VDC
 - 2.2.3.2 5A

2.3. Control Wiring

- 2.7.1. All control wiring shall be rated for 90C.
- 2.7.2. 500 Feet of 10AWG SIS wire (per switch) shall be used to connect existing TB's to new Switch.
- 2.7.3. Forks and Lugs may be used for different terminals.
- 2.7.4. There are approximately fifty terminations that will be made per switch.
- 2.7.5. **Permanent wire supports shall be used; no adhesive backed wire supports shall be used.**

2.4. Relay Contacts

- 2.4.1. The following normally open and closed relay outputs shall have contacts (aux contacts shall be rated no less than 8 amp at 30VDC or 125VDC) available for connection to MKVIe. These shall not be latched and clear as conditions return to normal.
 - 2.4.1.1. NC Closed
 - 2.4.1.2. NO Closed
 - 2.4.1.3. NO Opened
 - 2.4.1.4. NC Opened
 - 2.4.1.5. NO Close Command
 - 2.4.1.6. NC Close Command
 - 2.4.1.7. NO Open Command
 - 2.4.1.8. NC Open Command
 - 2.4.1.9. NO Spare
 - 2.4.1.10. NC Spare
 - 2.4.1.11. NO Spare
 - 2.4.1.12. NC Spare

2.5. Design

- 2.5.1. Service Life - The switches shall use components of adequate rating to provide an expected service life of twenty years continuous duty and 8 years without component replacement, excluding relays and capacitors.
- 2.5.2. Maintenance – Manuals shall clearly state how to maintain the switch with recommended spare parts needed and type of consumables that shall be required for the future.

2.6. Construction

- 2.6.1. Material and Workmanship
 - 2.6.1.1. Workmanship shall be first class in every respect.
 - 2.6.1.2. All material shall be new and of best commercial grade.
 - 2.6.1.3. Brackets and hardware shall be electroplated / galvanized with corrosion resistant material.
 - 2.6.1.4. Internal wiring shall be combined into cables, or bundles, and shall be tied.
 - 2.6.1.5. Electrical Clearances shall be accounted for and no cable insulation shall touch live bus bar.
 - 2.6.1.6. All wires shall be marked with a permanent marking system on both ends of each wire and must match drawings.

2.7. Approved Manufactures

- 2.7.1. Novolecs or approved equal by JEA.

2.8. Nameplate Markings

- 2.8.1. Switch Nameplate Markings:
 - 2.8.1.1. Nameplate shall be located in a conspicuous location.

- 2.8.1.2. Nameplate shall provide Model and Serial numbers.
- 2.8.1.3. Nameplate shall provide Voltage and Current Rating.
- 2.8.1.4. Nameplate shall provide BIL.
- 2.8.1.5. Nameplate shall provide Date of Manufacture.
- 2.8.1.6. Nameplate shall be stainless steel and embossed with above information.

3.0. EXECUTION

3.1. Manufacturing

- 3.1.1. The manufacturer shall design, build, test and arrange for shipment of (6) 89MD Switches.
- 3.1.2. The manufacturer shall design, build, test and arrange for shipment of (3) 89SS Switches.
- 3.1.3. The manufacturer shall prepare and deliver the required schematic drawings and instruction manuals with the equipment.

3.2. Site Preparation

- 3.2.1 The contractor shall prepare the site for installation of the equipment.
- 3.2.2 JEA Shall guarantee access to the building.

3.3. Installation

- 3.3.1. The electrical contractor shall install all the equipment with technical support from manufacturer.
- 3.3.2. The equipment shall be installed in accordance with local codes and the manufacturer's recommendations.
- 3.3.3. New half inch 316 Stainless steel hardware shall be used to replace bolting in all accessible locations for bus bar from the bushings at the top of the GECC to the cables that connect to the bottom of the 89SS.
- 3.3.4. New half inch 316 Stainless steel hardware shall be used to replace bolting in all accessible locations for bus bar above the switches to the cables that connect to the bottom of the 89MD switches.
- 3.3.5. Belleville washers shall be used on both sides of each bolted connection.
- 3.3.6. Each Belleville shall have a flat washer between the bus bar and itself.
- 3.3.7. The flat washer shall be thicker than the Belleville and at least 1/8th of an inch thick.
- 3.3.8. The flat washers shall be slightly larger in diameter than the Belleville's so that when the Belleville's are flattened out, they do not overlap the flat washers at any point.
- 3.3.9. The Electrical Contractor shall have had three industrial projects worth over \$ 150,000 per project in the past twelve months. The EC shall have one journeyman per apprentice on site at all times.
- 3.3.10. Any project regardless of value done at one of the power plants shall be considered a valid project for reference. Names, phone numbers and email addresses shall be given to JEA to confirm past project experience.
- 3.3.11. Contractor shall have one NETA certified technician on site during project installation.

3.4. Field Quality Control

- 3.4.1. The equipment shall be commissioned by a field service representative from manufacturer. A signed field service report shall then be submitted after the equipment is operational.

3.5. Spares

- 3.5.1. A list of manufacturer's recommended spare parts with pricing shall be submitted with the manuals.

3.6. Existing Drawings

- 3.6.1. See attachments

End of Specification

