

## SECTION 26 36 23

### AUTOMATIC TRANSFER SWITCH

#### PART 1: GENERAL

##### 1.01 SCOPE

- A. Furnish all labor, materials, equipment and appurtenances, install and test electrically operated, automatic transfer switch (ATS) equipment as shown on the Drawings and as specified herein.

##### 1.02 REFERENCES

- A. Products for, and the execution of, the work of this Section shall satisfy the applicable requirements of the latest NEC Codes and Federal, State, and Local regulations.

##### 1.03 SUBMITTALS

- A. Shall conform to the requirements of Specification Section 01 00 04 – Submittals.
- B. Shop drawings: Shop drawings shall indicate electrical characteristics and connection requirements, single-line diagrams, assembly wiring diagrams, equipment drawings, product description, and installation instructions. Shop drawings shall also clearly indicate enclosure size, gutter space, short circuit rating and continuous ampere rating of switch.
- C. Operation and Maintenance (O & M) Manuals: O&M manuals shall be submitted in accordance with the Contract Documents, and shall include detailed parts lists, lists of recommended spare parts, circuit diagrams, maintenance procedures and operating instructions (both automatic and manual). Contractor shall submit O&M manuals for each size of ATS.
- D. Product Data:
  - 1. Catalog sheets, specifications and installation instructions.
  - 2. Bill of materials.
  - 3. Detailed sequence of operations.
  - 4. Performance data: Performance data shall include equipment life, test, system functional flows, safety features and mechanical automated details.
  - 5. Company's data indicating maintenance schedule.
  - 6. Name, address and telephone number of nearest fully equipped service organization.

#### 1.04 QUALITY ASSURANCE

- A. ATS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, and installation and servicing in accordance with ISO 9001.
- B. Contractor shall be an authorized distributor of the specified ATS manufacturer with minimum three years documented experience.
- C. List of Completed Installations: Contractor shall furnish the name, address and telephone number of at least 5 comparable installations which can prove the proposed products have operated satisfactorily for 3 years.
- D. Contractor shall be a fully equipped service organization capable of responding within 8 hours to service calls, and shall be available 24 hours a day, 7 days a week to service the completed work.

#### 1.05 FACTORY TESTS

- A. ATS shall be thoroughly tested at the factory to ensure proper operation of the individual components and correct overall sequence of operation, and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the project requirements. Factory tests shall be conducted per UL standards, and a certified test report shall be submitted to Owner for review.

### **PART 2: PRODUCTS**

#### 2.01 GENERAL REQUIREMENTS

- A. Furnish material and equipment bearing evidence of UL listing where UL standards exist and manufacturer identification and customary size or rating data.
- B. Provide products that are free from defects impairing performance, durability, or appearance, and of the commercial quality best suited for the purpose shown on the Drawings or specified herein.
- C. ATS shall be rated for application with upstream power circuit breaker over-current/short-circuit protection.
- D. The voltage rating of the transfer switch shall be no less than the system voltage rating. The continuous current rating of the transfer switch shall be no less than the maximum continuous current requirements of the system.
- E. ATS shall be capable of being operated manually under full load conditions. The manual operator shall provide true quick-make, quick break operation to prevent possible flashovers from switching the contacts slowly. The control panel shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability and minimum maintenance. Where in-phase monitoring type switches are indicated, provide the assembly complete with all appurtenances and accessories needed to ensure in-phase monitoring of the transfer control to minimize transient disturbance and

ensure that the voltage of the source being transferred is at least 85% nominal prior to transfer. The control panel shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the control panel to be disconnected from the transfer switch for routine maintenance.

- F. Wiring/Terminations: Terminal blocks shall conform to NEMA ICS4. Terminal facilities shall be arranged for entrance of external conductors from the top or bottom of the enclosure. The main transfer switch terminals shall be suitable for the termination of conductors shown on the plans.

## 2.02 MATERIALS AND EQUIPMENT

- A. Acceptable Manufacturers:
  - 1. Caterpillar
  - 2. Emerson; ASCO Power Technologies
  - 3. Kohler Power Systems; Generator Division
  - 4. Onan/Cummins Power Generation; Industrial Business Group
  - 5. Thomson Power Systems
  - 6. Approved Equal
- B. ATS ratings and voltage shall be as indicated on the Drawings. Ampacity ratings indicated shall be full load (100%) acceptance values without de-rating.
- C. Ratings: ATS shall be rated for continuous duty at minimum of 125% of the required load capacity. Voltage rating, phase and pole shall match the available utility supply unless directed by the Owner or stated on the Drawings.
- D. ATS shall consist of an inherently double-throw power transfer switch unit and an electric controller interconnected to provide those complete operations and functions identified.
- E. ATS shall transfer the load utilizing in-phase monitor transition including voltage sensing modes in order to avoid out-of-phase transfer operation or shall be of the programmed transition type as indicated by these Contract Documents. Transfer Switch time-delay functions shall be adjustable for sequential transfer of equipment and load isolation as indicated.

## 2.03 AUTOMATIC TRANSFER SWITCHES - GENERAL

- A. Each ATS unit shall be electrically operated and mechanically held. The electrical operator shall be a solenoid mechanism, momentarily energized. The switch shall be double throw being inherently interlocked both mechanically and electrically to ensure only one of two possible positions, normal or emergency (stand-by). All main contacts shall move simultaneously on the same shaft, without the utilization of multiple snap-action devices.
- B. ATS shall be fully completely factory assembled and wired such that only external circuit connections are required in the field.

- C. ATS shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.
- D. All main contacts shall be silver composition. Switches rated 600 amp and above shall have segmented blow-on construction for high withstand current capability and be protected by separate arcing contacts. Provide one set of auxiliary Form C (SPDT) contacts; rated 10 amp at 120 V for remote monitoring or control action. Auxiliary contacts to be provided on each source position of the switch.
- E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.
- F. Where neutral conductors are to be solidly connected as shown on the Drawings, a neutral conductor terminal plate with fully rated AL-CU pressure connectors shall be provided.
- G. ATS shall be capable of being operated manually under full load conditions. The manual operator shall provide true quick-make, quick-break operation to prevent possible flashovers from switching the contacts slowly.
- H. Main contacts shall be designed to withstand multiple fault currents and shall meet UL 489 and/or UL 1087 requirements and shall be fully rated for all types of loads, inductive and resistive, without derating, either open or enclosed.
- I. Provide ATS complete with fully rated isolated by-pass switch where indicated.
- J. An engine generator exercise timer shall be provided, including a selector switch to select exercise with or without load transfer.

#### 2.04 TIME DELAYS

- A. An adjustable time delay shall be provided to override the momentary normal source outages and delay all transfer and engine starting signals.
- B. An adjustable time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.
- C. An adjustable time delay shall be provided on retransfer to normal, adjustable to 30 minutes. Time delays shall be automatically bypassed if emergency source fails and normal source is acceptable.
- D. A 5-minute cool down time delay shall be provided on shutdown of engine generator.
- E. All adjustable time delays shall be field adjustable without the use of tools.

## 2.05 ENCLOSURE

- A. In general, each ATS shall be furnished in a NEMA type 1 enclosure, unless otherwise directed by the Owner or shown on the Drawings.
- B. For outdoor applications, ATS shall be furnished in a NEMA type 3R enclosure. Contractor shall provide strip heater with thermostat for type 3R enclosure requirements.
- C. ATS shall be flush mounted display with LED indicators for switch position and source availability. ATS shall also include test and time delay by-pass switches.

## 2.06 NAMEPLATE

- A. ATS name plate markings shall include the following:
  - 1. Name of manufacturer and catalogue number, or equivalent serial number.
  - 2. Voltage and frequency ratings.
  - 3. Continuous current rating.
- B. Additional markings shall be those required by UL 1008.

## **PART 3: EXECUTION**

### 3.01 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to the site under provisions of this Contract.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to internal components, enclosure and finish.

### 3.02 INSTALLATION

- A. Products shall be installed, connected, and interconnected, where indicated, and in accordance with the manufacturer's printed instructions, as specified herein and as indicated on the Drawings. Connections shall be made in a manner which will ensure electrical continuity and operability of the products. Verify the work of other trades is complete to the extent that substrates on which electrical apparatus is to be installed is ready to receive same.

### 3.03 SERVICE WIRING

- A. Service installation as indicated on the Drawings except that the entire installation shall conform to the latest rules and regulations of the NEC.

### 3.04 TRAINING

- A. The ATS manufacturer shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. Training date shall be coordinated with Owner.

### 3.05 ON-SITE ACCEPTANCE TEST

- A. The complete installation shall be tested for compliance with the Specification following the installation of the Standby Power Generator unit; testing of the generator shall include on-site testing of the ATS. Testing shall be conducted by the Contractor in accordance with the manufacturer's literature with Owner representative being present. The Owner shall be notified in advance and shall have the option to witness the tests. The Contractor will be required to demonstrate operation of the transfer switch in bypass, normal and emergency modes.

### 3.06 ABBREVIATIONS

- A. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
- B. ASTM – AMERICAN SOCIETY for TESTING and MATERIALS
- C. EGSA – ELECTRICAL GENERATING SYSTEMS ASSOCIATION
- D. FCC – FEDERAL COMMUNICATIONS COMMISSION
- E. ICEA – INSULATED CABLE ENGINEERS ASSOCIATION
- F. IEC – INTERNATIONAL ELECTROTECHNICAL COMMISSION
- G. IEEE – INSTITUTE of ELECTRICAL and ELECTRONICS ENGINEERS
- H. MCC – MOTOR CONTROL CENTER
- I. NEC – NATIONAL ELECTRIC CODE
- J. NECA – NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
- K. NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
- L. NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
- M. NRTL- NATIONALLY RECOGNIZED TESTING LABORATORY
- N. OSHA – OCCUPATIONAL SAFETY and HEALTH ADMINISTRATION
- O. UL- UNDERWRITERS LABORATORIES
- P. VFD – VARIABLE FREQUENCY DRIVE

**END OF SECTION 26 36 23**