

GENERATOR TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

- A. Provide automatic transfer switches for control of the standby generator.

1.2 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division 1 and Section 26 00 00.
- B. The submittal shall include prototype test certification and specification sheets showing all standard and optional accessories to be supplied, schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number, each required interconnection between the generator set and the transfer switch if it is included elsewhere in these specifications.

1.3 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Provide written operating and maintenance instructions as specified in Section 16010. Include product data and operation/maintenance information for all system components.
- B. Provide sufficient training to personnel selected by the Owner on operation and basic maintenance of all systems and equipment.
- C. Employ manufacturer's field representative to demonstrate system operation to designated Owner personnel

1.4 FACTORY TESTING

- A. To assure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for design prototype tests, and final production tests.
  - 1. Design Prototype Tests: Components of the emergency system such as the engine/generator set, transfer switch, and accessories shall not be subjected to prototype tests since the tests are potentially damaging. Rather, similar design prototypes and pre-production models, which will not be sold, shall have been used for prototype tests.
  - 2. Final Production Tests: Each transfer switch shall be tested under load with all guards in place. Tests shall include:
    - a. The complete transfer switch shall be tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure

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that the operating transfer time, voltage, frequency, and time delay settings are in compliance with the specification requirements.

- b. The complete transfer switch shall be subjected to a dielectric strength test per NEMA Standard ICS 1-109.05.
- c. The control panel shall meet or exceed the voltage surge withstand capability in accordance with ANSI C37.90a-2978 and the impulse withstand voltage test in accordance with NEMA Standard ICS 1-109.

### 1.5 WARRANTY & MAINTENANCE

- A. The transfer switch shall be guaranteed against defective material and workmanship in accordance with the manufacturer's published warranty for one year from date of start-up. Optional warranties shall be available upon request.
- B. The transfer switch manufacturer and its distributor shall maintain a 24-hour parts and service organization. This organization shall be regularly engaged in a maintenance contract program to perform preventive maintenance and service on equipment similar to that specified. A service agreement shall be available and shall include system operation under simulated operating conditions, adjustment to the generator, transfer switch, and switchgear controls as required, and certification in the owner's maintenance log of repairs made and proper functioning of all systems.

### 1.6 COMPLIANCE WITH CODES AND STANDARDS

- A. The ATS shall conform to the requirements of:
  - 1. UL 1008--Standard for Automatic Transfer Switches.
  - 2. NFPA 70--National Electrical Code, including use in emergency and standby systems in accordance with Articles 517, 700.
  - 3. NFPA 99--Essential Electrical Systems for Health Care Facilities.
  - 4. NFPA 110--Standard for Emergency and Standby Power Systems.
  - 5. IEEE Standard 446--Recommended Practice for Emergency and Standby Power Systems (Orange Book).
  - 6. IEEE Standard 241--Recommended Practice for Electric Power Systems in Commercial Buildings (Gray Book).
  - 7. NEMA Standard ICS 2-447 Automatic Transfer Switches.

### 1.7 ELECTRICAL REQUIREMENTS

- A. Transfer switches not intended for continuous duty or repetitive load transfer switching are not acceptable.
- B. Transfer switches shall be rated in amperes for total system transfer including control of motors, electric-discharge lamps, electric heating, and tungsten-filament lamp load. Switches rated 400 amperes and below shall be suitable for 100% tungsten-filament lamp load. Switches rated above 400 amperes shall be suitable for 30% tungsten-filament load.

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- C. Transfer switches shall be rated to withstand the rms symmetrical short circuit current available at the automatic transfer switch terminals, with the type of overcurrent protection shown on the plans.

### PART 2 - PRODUCTS

#### 2.1 AUTOMATIC TRANSFER SWITCHES

- A. Acceptable Manufacturers:
  - 1. *Cummins.*
  - 2. *Onan.*
  - 3. *Kohler.*
  - 4. Substitutions: Or Approved Equal.
- B. Transfer switches shall have the following characteristics:
  - 1. Service entrance rated.
  - 2. Current rating as indicated on Drawings
  - 3. 3-Pole solid neutral, as indicated on Drawings
  - 4. 120/208 Volt-60Hz
  - 5. The transfer switches shall be furnished in a NEMA 1 enclosure.
  - 6. The switches shall be a 600-volt class.
  - 7. The withstand and closing ratings with current-limiting circuit breaker protective device shall be 14,000 Amps.
- C. All main contacts shall be of silver composition. The main contacts shall be protected by arcing contacts in sizes 400 amperes and above. The main contacts shall be of the blow-on configuration and of segmented construction in ratings 600 amperes and above.
- D. All contacts, coils, springs, and control elements shall be conveniently removable from the front of the transfer switch without major disassembly or disconnection of power conductors.
- E. The contact transfer time shall not exceed one-sixth of a second.
- F. All moveable parts of the operating mechanism shall remain in positive mechanical contact with the main contacts during the transfer operation without the use of separate mechanical interlocks.
- G. All contacts, coils, springs, and control elements shall be conveniently removable from the front of the transfer switch without major disassembly or disconnection of power conductors.
- H. The neutral conductor shall be solidly connected as shown on the plans, a neutral conductor terminal plate with fully rated AL-CU pressure connectors shall be provided.
- I. Transfer switches shall be provided with NEMA 1 surface mount enclosures with locking covers.

#### 2.2 TRANSFER SWITCH CONTROL SYSTEM

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- A. The control module shall direct the operation of the transfer switch. The module's sensing and logic circuitry must use a solid-state design for maximum reliability and minimum maintenance. The control module shall have a polarized disconnect plug to enable it to be disconnected from the transfer mechanism for routine maintenance.
- B. All printed circuit boards for the control module must be conformal coated on both sides for environmental protection.
- C. The control module must be mounted separately from the transfer mechanism unit for safety and ease of maintenance. Interfacing relays shall be industrial control grade plug-in type with dust cover.
- D. The control module shall include lamps to indicate normal or emergency source switch position and normal and emergency source availability. These lamps shall be visible when the enclosure door is closed.
- E. The control module must be upgradable with the following options:
  - 1. Switch position auxiliary contacts.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install transfer switches in full conformance with manufacturer's requirements and recommendations.
- B. Site Tests: The manufacturer's local representative shall perform an installation check, start-up, and building load test. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test.

END OF SECTION