SECTION 263600 – TRANSFER SWITCHES

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

This Section specifies transfer switches for switching between electrical energy sources in buildings and structures.

Provide all labor, materials, and equipment as necessary to complete all work as indicated on the drawings, and as specified herein for a complete operating system.

* + - * 1. Related Sections:

Applicable sections of Division 26 - Electrical

* + - 1. SUBMITTALS
				1. Shop Drawings

Shop Drawings including Catalog Cuts, Bills of Material, Wiring Diagrams and Physical Data.

* + - * 1. Manuals and Test Data

Operation and Maintenance Manuals including component part descriptions, part numbers, routine maintenance procedures, description of operation.

* + - 1. QUALITY ASSURANCE
				1. References

NEMA Standards ICS 2-447

UL-1008

ANSI/NFPA 70 – National Electric Code

1. PRODUCTS
	* + 1. AUTOMATIC TRANSFER SWITCHES

Note information to be shown on the drawings.

* + - * 1. Automatic transfer switches shall be 100% rated for continuous duty at full amperage, 4-pole type (3 phase plus switched neutral), solidly grounded, complete with the necessary accessories required to accomplish automatic changeover from normal to emergency supply source as indicated on the Drawings and as specified herein. Refer to drawings for electrical characteristics.
				2. The automatic transfer switch shall provide complete automatic operation. The automatic transfer switch shall be mechanically held and electrically operated by a mechanism energized from the source to which the load is to be transferred. The switch shall be rated for 100% continuous current loading at the specified rating and be inherently double throw. Provide in phase monitor or time delay transfer.
				3. The operating transfer time in either direction shall not exceed one-sixth (1/6) of a second.
				4. 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.
				5. Automatic transfer switches utilizing components of molded-case circuit breakers, contactors, or parts thereof which have not been intended for continuous duty or repetitive load transfer switching are not acceptable.
				6. The automatic transfer switch shall conform to the requirements of NEMA Standard ICS 2-447 and Underwriters' Laboratories UL-1008 and shall be UL listed as follows:

For use in emergency systems in accordance with the National Electrical Code.

Rated in amperes for total system transfer including control of motors, electric-discharge lamps, electric-heating and tungsten-filament lamp loads.

* + - * 1. The automatic transfer switch shall be rated to withstand at least 50,000 rms symmetrical short circuit amperes three phase and phase-to-phase ground.
				2. The automatic transfer switch shall be mounted in a NEMA Type 1 enclosure. Provide the entire assembly within the integral outdoor weatherproof generator enclosure.
				3. Automatic transfer switch shall be manufactured by Asco, Onan, or Caterpillar.
			1. PERFORMANCE FEATURES
				1. Provide a complete automatic engine starting control and automatic load transfer switch. The automatic equipment shall start the emergency generator and transfer load to the emergency source after a voltage drop in any one or more phases, and restore the load to the normal source, stop the generator set and reset itself for another complete cycle of operation within an adjustable time period after return of the normal service voltage.
				2. The automatic engine starting control shall initiate the engine by an auxiliary contact in the transfer switch (provide one normally-closed and one normally-open contact). If the engine fails to start the particular "failure" shall be annunciated on the generator control panel and maintain the control in the "tripped-out" position until reset.
				3. Provide a three position "manual-off-auto" selector switch that can, reset the engine control, manually start and operate the engine without transferring the load, and prevent operation of the generator set.
				4. The system shall be capable of being set up to automatically exercise the generator on a monthly basis under load.
				5. For 3 phase switches all phases of the normal voltage shall be monitored line-to-line. Close differential voltage sensing shall be provided. The pickup voltage shall be adjustable from 85% to 100% of nominal and the dropout voltage shall be adjustable from 75% to 98% of the pickup value. The transfer to emergency will be initiated upon reduction of normal source to 85% of nominal voltage and retransfer to normal shall occur when normal source restores to 95% of nominal.
				6. Permit simulation of normal power failure without load transfer, by a maintained contact test switch.
				7. A time delay to override momentary normal source outages to delay all transfer switch and engine starting signals. The time delay shall be field adjustable from 0.5 to 6 seconds.
				8. A time delay on retransfer to normal source. The time delay shall be automatically bypassed if the emergency source fails and normal source is available. The time delay shall be field adjustable from 0.5 to 30 minutes.
				9. An unloaded running time delay for generator cool-down. The time delay shall be field adjustable from 0 to 5 minutes and factory set at 5 minutes.
				10. A time delay on transfer to emergency. Initially set at zero but field adjustable up to 1 minute for controlled timing of load transfer to emergency, where indicated.
				11. Independent single phase voltage and frequency sensing of the emergency source. The pickup voltage shall be adjustable from 85% to 100% of nominal. Pickup frequency shall be adjustable from 90% to 100% of nominal. Transfer to emergency upon normal source failure when emergency source voltage is 90% or more of nominal and frequency is 95% or more of nominal.
				12. A contact that closes when normal source fails for initiating engine starting.
				13. A contact that opens when normal source fails for initiating engine starting.
				14. A white signal light to indicate when the automatic transfer switch is connected to the normal source. A yellow signal light to indicate when the automatic transfer switch is connected to the emergency source.
				15. One auxiliary contact that is closed when automatic transfer switch is connected to normal and one auxiliary contact that is closed when automatic transfer switch is connected to emergency.
				16. Permit the load to be served from the emergency source on a continuous basis, regardless of the suitability of the normal power source, by a maintained contact switch.
1. EXECUTION
	* + 1. FIELD QUALITY CONTROL
				1. Each transfer switch shall be furnished with an operator's manual providing installation and operation instructions.
				2. Install transfer switch where shown on the drawings, make all tests, corrections, and verify proper operation of switches.
				3. Perform complete operational testing of all design functions.

END OF SECTION 263600