

SECTION 16238 - TRANSFER SWITCHES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Types of transfer switches required for the Project and include the following:
 - 1. Automatic transfer.

1.02 SUBMITTALS

- A. Shop Drawings: Submit in accordance with Section 01300, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
 - 1. Product Data: Submit manufacturer's data and installation instructions for electrical power transfer switches.
 - 2. Wiring Diagrams: Submit wiring diagrams for electrical transfer switches, and associated control diagrams showing connections to prime and alternate power sources, electrical load, and equipment components. Differentiate between portions of wiring that are manufacturer installed and portions that are field installed.

1.03 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. UL Compliance: Comply with applicable requirements of UL 1008, "Automatic Transfer Switches," and UL 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors." Provide transfer switches and components which are UL listed and labeled.
 - 2. NEMA Compliance: Comply with applicable requirements of NEMA Standards Pub/Nos. ICS 2, "Industrial Control Devices, Controllers and Assemblies," ICS 6 and 250, pertaining to transfer switches.
 - 3. NFPA Compliance: Comply with applicable requirements of NFPA 99, "Standard for Health Care Facilities," and NFPA 101, "Code for Safety to Life from Fire in Buildings and Structures," pertaining to transfer switches.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
 - 1. Automatic Transfer Switches:
 - a. Automatic Switch Co. (ASCO).
 - b. Caterpillar, Inc.
 - c. Cummins.
 - d. ONAN

2.02 AUTOMATIC TRANSFER SWITCHES

- A. Automatic Transfer Switch: UL listed with voltage and amperage ratings (as shown on Drawings) and shall be the mechanically held, electrically operated type rated for continuous duty in an unventilated sheet metal enclosure.
- B. Switch shall be double throw, with an neutral/off position, having electrical operated normal-emergency positions inherently interlocked mechanically, and with main contacts mechanically attached to a common shaft. Main contacts shall be silver alloy wiping-action type. They shall be protected by arcing contacts.
- C. Switch and Relay Contacts, Coils, Springs, and Control Elements: Removable from front of transfer switch without removal of the switch panels from enclosure and without disconnection of drive linkages or power conductors. Sensing and control relays shall be continuous duty industrial control type with 600 volt, 10 amp rated contacts.
- D. Upon drop in normal voltage of 83-85 percent of rated voltage, and after an override delay of 0-120 seconds (user adjustable), switch shall start generator and transfer the load to emergency source, provided emergency source voltage and frequency are 90 percent of rated or higher.
- E. Upon return of normal source voltage for 5 seconds nominal, to 92-95 percent of rated, switch shall retransfer load to normal source after a minimum transfer time or if emergency source fails. Provide a 0 to 300-second adjustable time delay to maintain transfer switch in the "Off" position during transfer to either source. Provide a 0 to 300-second adjustable time delay to transfer to "emergency position".
- F. When power is restored, provide 0-300 seconds user adjustable delay to transfer to "neutral/off" position and then 0-300 seconds user adjustable delay to transfer to "utility power".
- G. Sensing relays shall sense all three phases, from each phase to ground and from phase to phase, operate without contact chatter or false response when voltage is slowly varied to dropout and pickup levels.
- H. Four auxiliary contacts shall be provided: Two for transfer switch position indicating use, and two auxiliary contacts, one N.O. and one N.C. to operate after completion of the user adjusted delay for starting generator. All auxiliary contacts shall be 600 volt, 10 amp continuous rating.
- I. Accessory devices shall be provided as follows:
 - 1. Time delay to override harmless power dips and outages. (Inverse time characteristic with voltage.)
 - 2. Test switch.
 - 3. Auxiliary contacts (as specified herein).
 - 4. Selector relay (as specified herein).
 - 5. Lockout relay (sensitive to voltage and frequency).
 - 6. Full phase protection with nominal 75-80 percent dropout and 92-95 percent pickup on phase relay.
 - 7. Adjustable time delay on retransfer to normal source. Minimum retransfer of 2 minutes and maximum of 25 minutes. Built-in circuitry to nullify the retransfer time delay if the emergency source fails and the normal source is available.

8. Adjustable (10-20 minutes) time delay for running generator unloaded after transfer for cool down.
 9. Adjustable time delay or delays (0-300 seconds) for holding transfer switch in the "Off" position when switching from standby source to normal and normal source to standby.
 10. Engine starting contact.
 11. Exerciser to exercise generator for 15 minutes every 168 hours. A selector switch shall permit generator to be exercised with or without load.
- J. Bypass-Isolation Switches: Provide factory-fabricated, manually operated, bypass-isolation switches and auxiliary equipment of types, sizes, ratings, and electrical characteristics for services indicated; used in conjunction with automatic transfer switch to provide a means of directly connecting load conductors to a power source and isolating the automatic transfer switch. Select switches with 2-way bypass to emergency source and capable of functioning as an independent manual transfer switch. In addition, design bypass switch with an intermediate position to permit electrical operation and testing of automatic transfer switch without affecting power to critical load. Provide capability for total electrical isolation of automatic transfer switch for maintenance, testing, and repair. Equip 3-pole drawout-type switches with gang-operated externally operated handle mechanism arranged for padlocking in open position with 1 to 3 padlocks. Provide free standing NEMA rated enclosure in accordance with the NEC.

PART 3 - EXECUTION

NOT USED

END OF SECTION