



SECTION 26 28 26 – ENCLOSED TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes transfer switches in individual enclosures.
- B. National Electrical Manufacturers Association:
 - 1. NEMA ICS 10 - Industrial Control and Systems: AC Transfer Switch Equipment.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. Underwriters Laboratories Inc.:
 - 1. UL 1008 - Transfer Switch Equipment.

1.2 SUBMITTALS

- A. Product Data: Submit catalog sheets showing voltage, switch size, ratings and size of switching and overcurrent protective devices, operating logic, short circuit ratings, dimensions, and enclosure details.
- B. Submit shop drawings after Short Circuit and Overcurrent Protective Device Coordination Study is approved. Shop drawings submitted without approved Study will be returned and not reviewed.
- C. Provide AIC rating of equipment that conforms to the approved Short Circuit and Overcurrent Protective Device Coordination Study.
- D. Provide 1/4"=1'-0" detailed and dimensioned floor plans and interior elevations of each area, room or enclosure where equipment is to be installed. Indicate actual dimensions of all equipment, location of all equipment within the area, room or enclosure, whether new or existing, and include all required code clearances and access requirements, door swings or other obstacles. Equipment on plans must be the actual equipment submitted for use on the Project. Shop drawing submittal without sketches will be returned without review.
- E. Provide equipment anchorage calculations and details for each section of each piece of equipment stamped and signed by a Structural Engineer retained by the Contractor. All details and calculations are subject to the review and approval of the project Structural Engineer of Record. Provide field review to determine all existing conditions required to perform the calculations.
- F. Provide data and information demonstrating the communications protocols necessary for integration into the LAWA building/energy management system.



1.3 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of enclosed transfer switches.
- B. Operation and Maintenance Data: Submit routine preventative maintenance and lubrication schedule. List special tools, maintenance materials, and replacement parts.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.
- B. Supplier: Authorized distributor of specified manufacturer with minimum three years documented experience.

1.5 MAINTENANCE SERVICE

- A. Furnish service and maintenance of transfer switches for one year from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 AUTOMATIC TRANSFER AND BYPASS/ISOLATION SWITCH

- A. Manufacturers:

- 1. Russelectric Inc.**
- 2. ASCO.**
- 3. Cummins.**
- 4. Eaton.**

Manufacturer must have nationwide factory-direct field service organization available on a 24-hour per day / 365 days per year call basis.

- B. Product Description: NEMA ICS 10, automatic transfer switch with load break type bypass isolation switch.
- C. Configuration: Draw-out type electrically-operated, mechanically-held transfer switch with manually-operated CONNECTED, TEST, AND DISCONNECTED draw-out positions, and with mechanically-operated, mechanically-held transfer switch connected to bypass automatic switch in both NORMAL and EMERGENCY positions. Provide rollers or casters to allow transfer switch to be removed from the enclosure.
- D. Rating: Voltage and current rating and number of poles as indicated on Drawings. Provide true 4-pole switch with all four poles mounted on a common shaft. Provide identical ratings for fourth pole.
- E. Bypass Switch Ratings: Match automatic transfer switch for electrical ratings and poles.



- F. Interrupting Capacity and Withstand Current Rating: Comply with Short Circuit and Overcurrent Protective Device Coordination Study.
- G. Product Features:
1. LED Indicating Lights: Mount in cover of enclosure to indicate NORMAL SOURCE AVAILABLE, ALTERNATE SOURCE AVAILABLE, SWITCH POSITION, NORMAL BYPASS, and ALTERNATE SOURCE BYPASS.
 2. Test Switch: Mount in cover of enclosure to simulate failure of normal source.
 3. Return to Normal Switch: Mount in cover of enclosure to initiate manual transfer from alternate source to normal source.
 4. Transfer Switch Auxiliary Contacts: 2 normally open; 2 normally closed.
 5. Normal Source Monitor: Monitor each line of normal source voltage and frequency; initiate transfer when voltage drops below 80 percent or frequency varies more than 10 percent from rated nominal value.
 6. Alternate Source Monitor: Monitor alternate source voltage and frequency; inhibit transfer when voltage is below 85 percent or frequency varies more than 3 Hertz from rated nominal value.
 7. In-Phase Monitor: Inhibit transfer until source and load are within acceptable limits.
 8. Switched Neutral: Non-Overlapping contacts.
 9. Provide LCD digital meter with 1% accuracy. Provide readout for voltage and frequency for all three phases for both normal and emergency source.
 10. Provide block-transfer and load-shed functions.
 11. Equip transfer switch with microprocessor based control system with real time clock and battery backup.
 - a. Equip with self-diagnostics.
 - b. Utilize industry standard open architecture communication protocol.
 - c. Serial communication port to allow interface with LAWA energy management system network. Provide MODBUS RTU and TCP/IP, BacNet Web Services and SNMP communications protocols to support integration into the LAWA building/energy management system.
 - d. Provide record storage and monitoring, logging and trending power data. Store in nonvolatile memory the following records: number of hours in emergency position; number of hours emergency available; total transfer in either direction; data, time, and description of the last four source failures; date of the last exercise period; and date of record reset.
 - e. Communicate by the controller via local display and serial communication the following meter readings: Current per phase RMS and neutral; Current Unbalance %; Voltage P-P and P-N; Voltage Unbalance %; Real Power (KW) Apparent Power (KVA) Reactive Power (KVAR) per phase and 3-phase; Frequency; Accumulated Energy (KWH, KVAH, KVARH).
 - f. Control and monitoring system shall communicate fully with paralleling switchgear.



- H. Automatic Sequence of Operation:
 - 1. Initiate Time Delay to Start Alternate Source Engine Generator: Upon initiation by normal source monitor.
 - 2. Time Delay To Start Alternate Source Engine Generator: 0 to 120 seconds, adjustable.
 - 3. Initiate Transfer Load to Alternate Source: Upon initiation by normal source monitor and permission by alternate source monitor.
 - 4. Time Delay Before Transfer to Alternate Power Source: 0 to 1800 seconds, adjustable.
 - 5. Initiate Retransfer Load to Normal Source: Upon permission by normal source monitor.
 - 6. Time Delay Before Transfer to Normal Power: 0 to 1800 seconds, adjustable; bypass time delay in event of alternate source failure.
 - 7. Time Delay Before Engine Shut Down: 0 to 1800 minutes, adjustable, of unloaded operation.
 - 8. Engine Exerciser: Start engine every 7 days; run for 0-600 minutes adjustable before shutting down. Bypass exerciser control when normal source fails during exercising period.
 - 9. Alternate System Exerciser: Transfer load to alternate source during engine exercising period.
- I. Enclosure:
 - 1. Enclosure: ICS 10, Type 1.
 - 2. Finish: Manufacturer's standard gray enamel.

2.2 SOURCE QUALITY CONTROL

- A. Furnish shop inspection and testing of each transfer switch.
- B. Make completed transfer switch available for inspection at manufacturer's factory prior to packaging for shipment. Notify LAWA at least seven days before inspection is allowed.
- C. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify LAWA at least seven days before inspections and tests are scheduled.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install 4 inch concrete housekeeping pads extending 4 inches beyond enclosure in all directions.
- B. Install engraved plastic nameplates.



3.2 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS.

3.3 MANUFACTURER'S FIELD SERVICES

- A. Check out transfer switch connections and operations and place in service.

3.4 ADJUSTING

- A. Adjust control and sensing devices to achieve specified sequence of operation.

3.5 DEMONSTRATION AND TRAINING

- A. Demonstrate operation of transfer switch in bypass, normal, and emergency modes to LAWA's staff. Provide 8-hour training sessions for each of 3 shifts for groups of up to 10 LAWA personnel each.

END OF SECTION 26 28 26