1 General
1.1 This Section includes transfer switches rated 600 V and less, including the following:
1.2 Automatic transfer switches

2 Products
2.1 Manufacturers
2.1.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- ASCO Power Technologies
- Russelectric

3 General Transfer-Switch Product Requirements
3.1 Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.
3.2 Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
3.2.1 Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are not acceptable.
3.2.2 Switch Action: Double throw; mechanically held in both directions.
3.2.3 Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.
3.2.4 Enclosures: General-purpose NEMA Type 1 enclosure, unless otherwise indicated on plans.

4 Automatic Transfer Switches
4.1 Comply with Level 1 equipment according to NFPA 110.
4.2 Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.
4.3 Retain paragraph below if digital communication system is used for remote annunciation or for remote annunciation and control, or if building management system is present at facility and uses protocol such as Modbus to poll data from devices, or uses SCADA systems.
4.5 For optional standby and standby applications include the following functions and characteristics for automatic closed transition transfer switches:
4.5.1 Fully automatic make before break
4.5.2 Load transfer without interruption, through momentary interconnection of both power sources not exceeding 100ms.
- Initiation of No-Interruption Transfer: Controlled by in-phase monitor and sensors confirming both sources are present and acceptable.
- Initiation occurs without active control of generator.
- Controls ensure that closed-transition load transfer closure occurs only when the 2 sources are within plus or minus 5 electrical degrees maximum, and plus or minus 5 percent maximum voltage difference.
4.5.3 Failure of power source serving load initiates automatic break-before-make transfer.
4.5.4 The transfer switch controls shall also be provided shall also be provided with a “Failure Recovery” circuit, designed to prevent the Normal and Emergency contacts from remaining closed at the same time for more than 100 milliseconds during closed transition mode. During the process of transferring between sources, if one of the two single-solenoid operators fails to open its main contact, the ATS control panel will recognize the condition and send a signal to re-open the last operator that successfully closed. Following the Failure Recovery operation, the “Extended Parallel” light will be illuminated and the ATS controls will be locked out. The Failure Recovery Circuit will be operational whether the controls are transferring in both directions. As a second level of protection, the ATS controls are provided with (2) sets of Form-C contacts that can be used to shunt trip one of the two source breakers to actively separate the utility and generator sources, in the event that “Failure Recovery” was not successful.
4.6 In-Phase Monitor: Factory-wired, internal relay controls transfer so it occurs only when the two sources are synchronized in phase System LCD controller/display. Shall include the following features:
4.6.1 Self Diagnostics: The controller shall contain a diagnostic screen for the purpose of detecting system errors.
4.6.2 Data Logging: The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in non-volatile memory:
- Current system status.
- Event Logging:
- Data and time and reason for transfer normal to emergency
- Data and time and reason for transfer emergency to normal
- Data and time and reason for engine start.
- Data and time engine stopped.
- Data and time emergency source available.
- Data and time emergency source not available.

4.6.3 Statistical Data:
- Total number of transfers.
- Total number of transfers due to source failure.
- Total number of days controller is energized.
- Total number of hours both normal and emergency sources are available.

4.7 For applications requiring metering Include the following power quality meter: SEL 735 Power Quality Meter connected to transfer switch load terminals:

4.7.1 The power monitor shall be flush mounted to the transfer switch enclosure.

4.8 Automatic Transfer-Switch Features:
4.8.1 Test Switch: Simulate normal-source failure.
4.8.2 Switch-Position Pilot Lights: Indicate source to which load is connected.
- Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
- Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

5 Additional Features
5.1.1 Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.

5.1.2 Push-button programming control with digital display of settings.
5.1.3 Integral battery operation of time switch when normal control power is not available.

5.2 For critical applications Include the following functions and characteristics for bypass/isolation switches:
- Bypass to the load-carrying source shall be accomplished with no interruption of power to the load (make before break contacts). Designs which disconnect the load when bypassing are not acceptable. The bypass handle shall have three operating modes: "Bypass to Normal," "Automatic," and "Bypass to Emergency."

6 Source Quality Control
6.1 Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

6.2 If transfer switch remote test/monitor is required then include: transfer switch remote annunciator system

6.3 Functional Description: Remote annunciator panels shall annunciate conditions for indicated transfer switches. Annunciation shall include the following:
- Sources available, as defined by actual pickup and dropout settings of transfer switch controls.
- Switch position.
- Switch in test mode.
- Failure of communication link

6.4 Annunciator Panel
6.4.1 LED-lamp type with audible signal and silencing switch
6.4.2 Indicating Lights: Grouped for each transfer switch monitored.
6.4.3 Label each group, indicating transfer switch it monitors, location of switch, and identity of load it serves.
6.4.4 Label each group, indicating transfer switch it monitors, location of switch, and identity of load it serves.
6.4.5 Mounting: flush.
6.4.6 Lamp Test: Push to test or lamp test switch on front panel.
6.4.7 Key operator with lockout function.
6.4.8 Ethernet Communications with web interface.

7 Warranty

7.1 Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of transfer switch and associated auxiliary components that fail in materials or workmanship within specified warranty period. Warranty is comprehensive and shall include all parts & labor for specified period.

7.2 Warranty period: 100% parts & labor for (2) Years from shipment, then 100% parts only for (5) Years from shipment.