

# SUGGESTED SPECIFICATION

for

## Series 300 Service Entrance Rated Automatic Transfer Switches

### PART 1 GENERAL

#### 1.01 Scope

- A. Furnish and install automatic transfer switches (ATS) with number of poles, amperage, voltage, and withstand current ratings as shown on the plans. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.
- B. Furnish an enclosure for the ATS that is for service entry. It shall provide all of the proper disconnecting, protection, grounding and bonding required for service entrance equipment.

#### 1.02 Acceptable Manufacturers

Service Entrance Automatic transfer switches shall be ASCO Series 300SE. Any alternate shall be submitted to the consulting engineer in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

#### 1.03 Codes and Standards

The automatic transfer switches and accessories shall conform to the requirements of:

- A. UL 1008 - Standard for Automatic Transfer Switches
- B. NFPA 70 - National Electrical Code
- C. NFPA 110 - Emergency and Standby Power Systems
- D. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- E. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
- F. NEC Articles 700, 701, 702
- G. International Standards Organization ISO 9001
- H. UL 891 According to this UL standard the equipment shall be labeled: "Suitable for use only as service equipment."
- I. UL 508 Industrial Control Equipment

### PART 2 PRODUCTS

#### 2.01 Mechanically Held Transfer Switch

- C. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include overcurrent disconnect devices will not be accepted. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.

- D. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.
- E. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand current capability and be protected by separate arcing contacts.
- F. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.
- G. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
- H. Where neutral conductors must be switched, the ATS shall be provided with fully-rated neutral transfer contacts.
- I. Where neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.

## **2.02 Microprocessor Controller with Membrane Interface Panel**

- A. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.
- B. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.
- C. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
  - 1. ANSI C37.90A/IEEE 472 Voltage Surge Test
  - 2. NEMA ICS – 109.21 Impulse Withstand Test
  - 3. IEC801-2 Electrostatic discharge (ESD) immunity
  - 4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity
  - 5. IEC 801 – 4 Electrical fast transient (EFT) immunity
  - 6. ENV50142 Surge transient immunity
  - 7. ENV50141: Conducted radio-frequency field immunity
  - 8. EN55011: Group 1, Class A conducted and radiated emissions
  - 9. EN61000 –4 – 11 Voltage dips and interruptions immunity

### **2.03 Enclosure**

- A.** The ATS shall be furnished in a NEMA type 1 enclosure unless otherwise shown on the plans.
- B.** Provide strip heater with thermostat for Type 3R enclosure requirements.
- C.** Controller shall be flush-mounted display with LED indicators for switch position and source availability. It shall also include test and time delay bypass switches.
- D.** The complete assembly shall be degreased, and thoroughly cleaned through a five-stage aqueous process. The finish shall be ANSI-61, light gray, electrostatically-charged polyester powder paint over a phosphate coating, at a minimum of 2.0 mils in density. Finish shall be suitable for indoor and outdoor environments.
- E.** For those automatic transfer switches that are less than 1000 amperes, the connection between the normal disconnecting device and the ATS shall be made with the appropriate size cable. For those automatic transfer switches that are greater than 1000 amperes, the connection between the normal disconnecting device and the ATS shall be made with the appropriate size bus. Bus shall be silver plated copper rated no less than 1000 amps per square inch.
- F.** A pressure disconnect link shall be provided to disconnect the normal source neutral connection from the emergency and load neutral connections for 4-wire applications. A ground bus shall be provided for connection of the grounding conductor to the grounding electrode. A pressure disconnect link for the neutral to ground bonding jumper shall be provided to connect the normal neutral connection to the ground bus.
- G.** Control wiring shall be rated for 600 volt, UL 1015. Wires shall be placed in wire duct or harnessed, and shall be supported to prevent sagging or breakage from weight or vibration. All wiring to hinged doors shall be run through door terminal blocks or connection plugs.

### **2.04 Disconnecting and Overcurrent Protection Device**

- A.** For those automatic transfer switches less than 1000 amperes, the normal connection shall be provided with a thermal magnetic rated molded case circuit breaker with current ratings as shown on the plans. It shall have a thermal magnetic trip unit.
- H.** For those automatic transfer switches rated above 1000 amperes, the normal connection shall be provided with a stationary mount, insulated case circuit breaker with a solid-state trip unit. The trip unit shall have an adjustable long time, short time, instantaneous, and ground fault trip settings. The insulated case circuit breaker shall trip open when the ground fault setting is exceeded.

## **PART 3 OPERATION**

### **3.01 Voltage and Frequency Sensing**

- A.** The voltage of each phase of the normal source shall be monitored, with pickup adjustable to 95% of nominal and dropout adjustable from 70% to 90% of pickup setting.
- B.** Single-phase voltage and frequency sensing of the emergency source shall be provided.

### **3.02 Time Delays**

- A.** An adjustable time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.
- B.** An adjustable time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.
- C.** An adjustable time delay shall be provided on retransfer to normal, adjustable to 30 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.
- D.** A 5-minute cooldown time delay shall be provided on shutdown of engine generator.
- E.** All adjustable time delays shall be field adjustable without the use of tools.

### **3.03 Additional Features**

- A.** A set of gold-flashed contacts rated 10 amps, 32 VDC shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
- B.** A push-button type test switch shall be provided to simulate a normal source failure.
- C.** A push-button type switch to bypass the time delay on transfer to emergency, the engine exerciser period on the retransfer to normal time delay whichever delay is active at the time the push-button is activated.
- D.** Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact, closed, when the ATS is connected to the emergency source.
- E.** Indicating lights shall be provided, one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). Also provide indicating lights for both normal and emergency source availability.
- F.** Terminals shall be provided to indicate actual availability of the normal and emergency sources, as determined by the voltage sensing pickup and dropout settings for each source.
- G. Engine Exerciser** - An engine generator exercising timer shall be provided, including a selector switch to select exercise with or without load transfer.

- H. Inphase Monitor** - An Inphase monitor shall be inherently built into the controls. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the ATS manufacturer.
- I. Selective Load Disconnect** - A double throw contact shall be provided to operate after a time delay, adjustable to 20 seconds prior to transfer and reset 0 to 20 seconds after transfer. This contact can be used to selectively disconnect specific load(s) when the transfer switch is transferred. Output contacts shall be rated 6 amps at 28 VDC or 120 VAC.

**Optional Accessories (Specify if Required)**

- J. Communications Interface** – Serial Module (5110) to allow local or remote communications with ASCO PowerQuest or Siteweb communication products. To connect Series 300 Service Entrance Automatic Transfer Switches, and ASCO ATS Annunciators to the serial network via an RS485 interface (Accessory 72A).
- K. Programmable Engine Exerciser** - A seven or fourteen day programmable engine exerciser with digital readout display. Shall include one form C contact for availability of normal and emergency. Include “with or without” load control switch for exerciser period. The exerciser shall be backed up by a permanent battery. (Accessory 11BG).
- L. Enclosure Heater** - A 125 watt enclosure heater with transformer and thermostat (adjustable from 30° to 140 ° F) (Accessory 44 G).
- M. PowerQuest (Monitoring System)**  
A PC based Automatic Transfer Switch (ATS) monitoring system designed to communicate with other ATSS located in remote locations shall be provided. System shall utilize serial communications capability inherent with the ATS microprocessor-based control panel product offering. Refer to separate Suggested Specification.

## **PART 4 ADDITIONAL REQUIREMENTS**

### **4.01 Withstand and Closing Ratings**

- A.** The ATS shall be rated to close on and withstand the available rms symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans. WCR ATS ratings as be as follows when used with specific circuit breakers:

<b>ATS Size</b>	<b>Withstand &amp; Closing Rating MCCB</b>	<b>W/CLF</b>
150 – 200	22,000A	200,000
225 – 400	42,000A	200,000
600 – 1200	65,000A	200,000
1600 – 2000	85,000A	200,000
2600 – 3000	100,000A	200,000

### **4.02 Tests and Certification**

- A.** The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.
- B.** Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.
- C.** The ATS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001.

### **4.03 Service Representation**

- A.** The ATS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.
- B.** The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.
- C.** For ease of maintenance and parts replacement, the switch nameplate shall include drawing numbers, part numbers for main coil and control.