

SUGGESTED SPECIFICATION

for

Series 300 Manual Service Entrance Rated Automatic Transfer Switches (3MUS)

PART 1 GENERAL

1.01 Scope

- A.** Furnish and install manual transfer switches (MTS) with number of poles, amperage, voltage, and withstand current ratings as shown on the plans. Each manual transfer shall consist of a 3 position center off mechanically held power transfer switch unit and a mechanical operating mechanism to provide complete manual operation. All transfer switches and mechanical operating mechanism shall be the product of the same manufacturer.
- B.** Furnish an enclosure for the MTS 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 manual transfer switches shall be ASCO Series 300 (3MUS). 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 manual transfer switches and accessories shall conform to the requirements of:

- A.** UL 1008 Listed for Optional Standby Transfer Switches (Manual Transfer Switches)
- B.** CSA C22.2 No.178 1978
- C.** IEC 60947-6-1 Low – Voltage Switchgear and Controller
- D.** NFPA 70 - National Electrical Code
- E.** NFPA 99 – Essential Electrical Systems for Health Care Facilities
- F.** IEEE Standard 446 - IEEE Recommended Practice for Emergency and StandbyPower Systems for Commercial and Industrial Applications
- G.** UL 508 Industrial Control Equipment
- H.** UL 891 Switchboards
- I.** NEC Article 700.3 (F)
- J.** International Standards Organization ISO 9001: 2008
- K.** RoHs compliant (Restriction of Hazardous Substances)
- L.** Seismic qualification – International Building Code & OSHPD to SDS level of 2.5

PART 2 PRODUCTS

2.01 Mechanically Held Transfer Switch

- A.** The transfer switch unit shall be manually operated and mechanically held. The switch shall be mechanically interlocked to ensure only one of three possible positions, Source 1, Source 2, or Center Off Fused disconnect type switches shall not be acceptable.
- B.** 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.
- C.** 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.
- D.** Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors.
- E.** 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.
- F.** Where neutral conductors must be switched, the ATS shall be provided with fully-rated neutral transfer contacts.
- G.** Where neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.
- H.** The MTS shall be tested in accordance with UL 1008 for transfer switches. Switch ratings of 260 amperes or less shall have endurance rating of 6000 cycles, 400 ampere shall have endurance rating of 4000 cycles, and 600 – 1200 shall have endurance rating of 3000 cycles.

2.02 ENCLOSURE

- A.** The 3MUS shall be furnished in a NEMA type 1 enclosure unless otherwise shown on the plans.
- A.** Enclosures shall be free standing, or floor mounted
- B.** 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. Ource
- C.** For those manual transfer switches that are less than 1000 amperes, the connection between preferred disconnecting device and the MTS shall be made with the appropriate size cable. For those manual transfer switches that are greater then 1000 amperes, the connection between the preferred disconnecting device and the ATS shall be made with the appropriate size bus. Bus shall be silver plated copper rated no less than a 1000 amps per square inch.

- D. A pressure disconnect link shall be provided to disconnect the preferred source neutral connection from the alternate 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 connection to the ground bus.
- E. Outdoor enclosures shall be available in 316 stainless steel. Provide strip heater with thermostat for Type 3R enclosure requirements

PART 3 OPERATION

3.01 Manual Operations Provisions

- A. The transfer switch shall be arranged for manually actuated manual operation.
- B. The manual transfer shall be actuated via a mechanical operating mechanism.
- C. The manual operating handle shall be capable of external operation without opening the enclosure door.
- D. It shall have the same contact to contact speed as automatic operation
- E. There shall be three positions for manual operation:
 - 1. Connected to Source 1 (preferred)
 - 2. Connected to Source 2 (alternate)
 - 3. Connected to center off (disconnected position)
- F. Switch position when connected to Source 1, or Source 2 shall be pad - lockable

3.02 ADDITIONAL FEATURES

- A. Mechanical position indicators (yellow) visible to the operator shall be included for Source 1 (preferred), Source 2, (alternate), and Center Off (disconnected).
- B. Optional LED indicators shall be available for Source 1 (preferred), and Source 2 (alternate).
- C. Auxiliary position indicating contacts, rated 10 amps, 250 Vac shall be provided consisting of one closed when the MTS is connected to Source 1 (preferred), and one contact closed when the MTS is connected to Source 2 (alternate)
- D. A form A contact shall be provided to indicate switch is in the Center Off (disconnected) position.

PART 4 ACCESSORIES

4.01 Optional Features *(The following section is optional and should be deleted if not required)*

A. Enclosure Heater(s)

A 120v strip heater with thermostat and terminal block shall be provided for outdoor installations where type 3R, 4, enclosures are specified. External 120v power source required. (This feature shall be equal to ASCO accessory 44A, and shall be capable of being added to existing switches).

A 125 watt enclosure heater with transformer and thermostat (adjustable from 30° to 140 ° F) shall be provided for outdoor installations where type 3R, 4, enclosures are specified. (This feature shall be equal to ASCO accessory 44G, and shall be capable of being added to existing switches).

B. Surge Suppression – A TVSS with a surge current rating of 65kA shall be provided with individually matched fused metal oxide varistors (MOVs). It shall include LED status indication of normal operation, under voltage, power loss, phase loss or component failure. Shall include form C dry contacts for external alarm or monitoring. The unit shall be enclosed in a Noryl housing rated NEMA 4, 12, and 4X. Shall comply with UL 1449 3rd edition. (This feature shall be equal to ASCO accessory 73).

C. Auxiliary Contacts - Position indicating contacts, rated 10 amps, 250 Vac shall be provided consisting of two closed when the MTS is connected to Source 1 (preferred), and two contact closed when the MTS is connected to Source 2 (alternate). (This feature shall be equal to ASCO accessory 14AA/14BA).

D. Accessory 170 Base Package Bundle – Two form C contacts shall be connected to customer terminal block that operate when Source 1 and Source 2 voltage is present at transfer switch terminals. The following indicators shall be provided:

1. Load Connected to Source 1 (Green).
2. Load Connected to Source 2 (Red).
3. Source 1 Available (Green).
4. Source 2 Available (Red).
5. Load Disconnect (Yellow)

(This feature shall be equal to ASCO accessory 170B).

Other options shall be made available phase rotation, maintained engine start switch, and keyed maintained engine start

See table below for other accessory 170 configurations (shall include base package bundle)

	Source Available/Connected to/Disconnected LEDs & Contacts	Phase Rotation Monitor	Maintained Engine Start Switch & Common Alarm LED/Contact	Keyed Maintained Engine Start Switch & Common Alarm LED/Contact	IO Module
170B	X				
170E	X		X		
170K	X			X	
170B1	X				X
170E1	X		X		X
170K1	X			X	X
170BP	X	X			
170EP	X	X	X		
170KP	X	X		X	
170BP1	X	X			X
170EP1	X	X	X		X

PART 5 ADDITIONAL REQUIREMENTS

5.01 Withstand and Closing Ratings

- A. The MTS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the MTS terminals with the type of overcurrent protection shown on the plans. WCR MTS ratings @ 480v shall be as follows when used with specific circuit breakers or current limiting fuses:

MTS Size	Withstand & Closing Rating MCCB	W/CLF
150 - 600	50,000A	200,000
800 - 1200	65,000A	200,000

5.02 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.

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

6.02 Tests and Certification

- A.** The complete MTS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure 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 MTS manufacturer shall be certified to ISO 9001: 2008 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: 2008.

6.03 Service Representation

- A.** The MTS 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 switch shipments, by serial number, for a minimum of 20 years.
- C.** For ease of maintenance, the transfer switch nameplate shall include drawing numbers and serviceable part numbers