SERIES 300 AUTOMATIC TRANSFER SWITCH

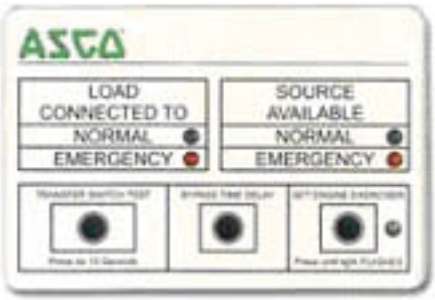
ASCO Series 300 automatic transfer switches are suitable for emergency and standby power system applications.
Sizes 30 through 3000 amps in a compact design with 2, 3, & 4 pole configurations. Available 120 to 600VAC. UL 1008 listed to 480VAC for total system loads. True double-throw, inherently interlocked construction. Mechanically held, electrically operated utilizing a reliable, field-proven single solenoid operator. Contacts easily accessible for easy inspection and preventive maintenance. Meets National Electric Code requirements (US). Rated for emergency and standby applications.

- Standard models in stock.
- Available in Type 1 and 3R enclosures 30 through 3000 amps. Type 1, 3R, 4 and 12 from 30 to 1600 amps.
- Conversion kits available from stock to allow field addition of Optional Accessories.
- Qualified and listed to CSA C22.2 No. 178 and UL 1008 automatic transfer equipment standards.

Control Panel Standard Features & Design Criteria

Standard Features:

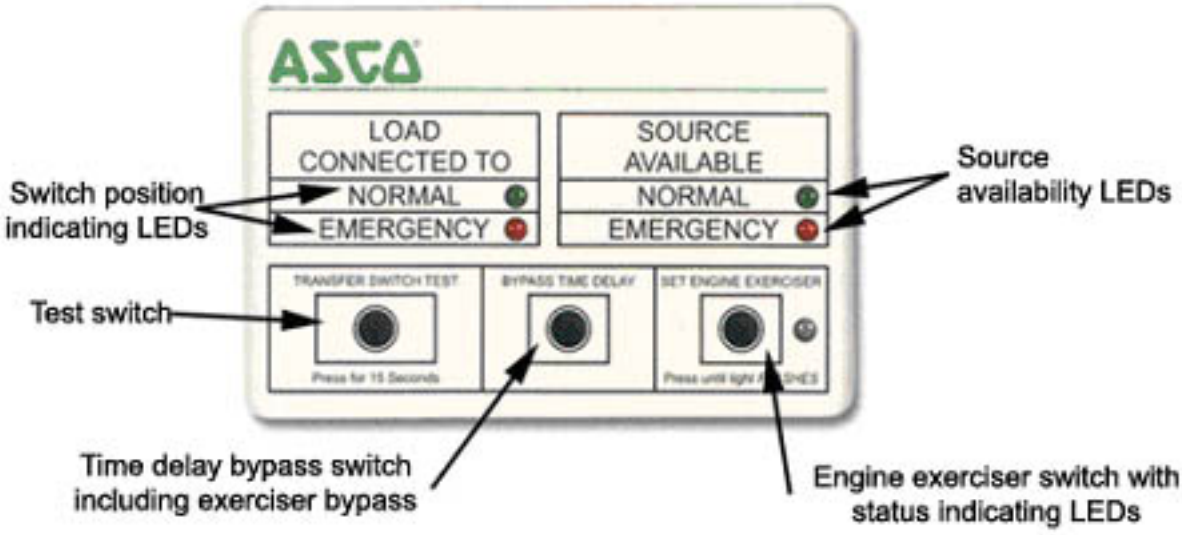
- Motor load transfer controls (inphase monitor) to keep motors operating during transfer.
- Pre-transfer & post-transfer load disconnect contacts for signaling motor starters, elevators, VFDs and other selected loads.
- Standard Engine Exerciser for weekly automatic testing of engine generator set with or without load.
- Selectable control switches for voltage, frequency, time delay settings & additional control features.
- Switch position lights, source availability lights, test switch and time delay bypass switch.



Electromagnetic Computability Testing:

- EN61000-4-2:1995 Electrostatic discharge (ESD) immunity.
- ENV50140:1993 Radiated electromagnetic field immunity.
- EN61000-4-4:1995 Electrical fast transient (EFT) immunity.
- EN61000-4-5:1995 Surge transient immunity.
- ENV50141:1993 Conducted radio-frequency field immunity.
- EN55011:1991 Group 1, Class B conducted and radiated emission.

Standard Operational Features, Controls and Status Indicators



Standard Selectable Features

- Inphase monitor to transfer motor loads without any intentional off time to help prevent motor inrush currents from exceeding normal starting levels.
- Engine exerciser to automatically test engine generator each week. Includes control switch for testing with or without load.
- Selective load disconnect, double-throw contact to operate at an adjustable 0 to 20 second time delay prior to transfer and reset 0 to 20 seconds after transfer.
- 60 Hz or 50 Hz selector switch.
- Three-phase/single-phase selector switch.

Voltage & Frequency Sensing

- Adjustable three-phase, close differential voltage sensing on normal source.
- Normal source pickup voltage is adjustable to 95% of nominal; drop-out is adjustable from 70 to 90% of nominal.
- Frequency sensing on emergency source. Pickup at 95% and dropout at 85% of nominal.
- Time Delays
- Adjustable time delay to over ride momentary normal source outages to delay all transfer switch and engine-starting signals.
- Transfer to emergency time delay. Adjustable from 0 to 5 minutes for controlled timing of load transfer to emergency.

- Retransfer to normal time delay. Adjustable to 30 minutes.
- Five-minute unloaded running time delay for emergency engine generator cool down.
- Four-second time delay to override momentary to ignore momentary voltage and frequency transients during initial genset loading.

Standard Control Contacts

- Switch position indicating contacts (rated 10 amps 250VAC, 32VDC). (1) for Normal position, (1) for Emergency position.
- Gold plated engine start contacts (rated 5 amps 28VDC or 120VAC).

Remote Control Features Terminal provisions for connecting:

- Remote test switch.
- Remote contact for test or for peak shaving applications. Circuit will be automatically bypassed if emergency source fails.
- Inhibit transfer to emergency.
- Remote time delay bypass switch.

UL Listed Withstand and Close-On Ratings

Switch Rating amps	Available Symmetrical Amperes RMS at 600 VAC	
	When Used With Current Limiting Fuses	When Used With Specific Circuit Breakers
30	100,000	10,000
70, 100, 104, 150	200,000	22,000
200 (240 V Max.)	200,000	22,000
225, 260, 400	200,000	42,000
600, 800, 1000, 2000	200,000	65,000
1600, 2000	200,000	85,000
2600, 3000	200,000	100,000

Current limiting fuse should be Class J type through 600 amp fuse rating, use Class L type over 600 amps.

Dimensions and Shipping Weights - UL Type 1 Enclosure

Switch Rating amps	Phase Poles	Neutral Code	Dimensions, In. (mm)[3]			Approx. Shipping Weight Lb. (kg)[4]
			Width	Height	Depth	
30,70,100*,104 * Series 386 only	2	A	17 1/2 (445)	31 (787)	11 5/8 (295)	66 (31)
	2	B	17 1/2 (445)	31 (787)	11 5/8 (295)	70 (32)
	3	A	17 1/2 (445)	31 (787)	11 5/8 (295)	70 (32)
	3	B	17 1/2 (445)	31 (787)	11 5/8 (295)	74 (33)
150, 200	2	A	17 1/2 (445)	31 (787)	11 5/8 (295)	69 (32)
	2	B	17 1/2 (445)	31 (787)	11 5/8 (295)	73 (33)
	3	A	17 1/2 (445)	31 (787)	11 5/8 (295)	73 (33)
	3	B	17 1/2 (445)	31 (787)	11 5/8 (295)	75 (34)
225, 260, 400	2	A	18 (457)	48 (1219)	13 (330)	100 (45)
	2	C	18 (457)	48 (1219)	13 (330)	110 (50)
	3	A	18 (457)	48 (1219)	13 (330)	110 (50)
	3	C	18 (457)	48 (1219)	13 (330)	120 (55)
600, 800, 1000	2	A	34 (864)	72 (1829)	20 (508)	450 (204)
	2	B	34 (864)	72 (1829)	20 (508)	475 (217)
	3	A	34 (864)	72 (1829)	20 (508)	475 (217)
	3	B	34 (864)	72 (1829)	20 (508)	500 (228)
1200	2	A	38 (965)	87 (2210)	24 (610)	685 (312)
	2	B	38 (965)	87 (2210)	24 (610)	705 (321)
	3	A	38 (965)	87 (2210)	24 (610)	705 (321)
	3	B	38 (965)	87 (2210)	24 (610)	725 (328)
1600, 2000[1,6]	3	A	38 (965)	87 (2210)	24 (610)	925 (419)
	3	B	38 (965)	87 (2210)	24 (610)	975 (441)
2600, 3000[2]	3	A	38 (965)	91 (2311)	60 (1524)	1700 (771)
	3	B	38 (965)	91 (2311)	60 (1524)	2135 (969)

Notes:

1. Unit is designed for top cable entry of emergency & load and bottom entry of normal. A cable pull box is also available for all top or bottom cable access when required (optional Accessory Kit #K609027). Not required for type 3R, 4 &12 enclosures where available
2. Enclosures for 2600, 3000 amps are free-standing with removable top, sides & back.
3. For Type 3R, 4 & 12 dimensions, add the following values to the Type 1 dimensions:
   a) 30, 70, 104, 150, 200A - add 1.5 in. (38 mm) to the height.

b) 400A - add 1.5 in (38mm) to the depth.
c) 1200A - type 4 & 12 not available - use 1600 amp switch
d) 1600A - add 3 in. (76 mm) to the height and 10 in. (253 mm) to the width.
e) 2000, 2600, 3000A - Type 4 & 12 not available. (Consult ASCO) Type 3R add 4.68 in (118 mm) to the height, add 2.0 in (51 mm) to the width and add 13 in (329 mm) to the depth.

4. For Type 3R, 4 & 12 weights, add the following values to the Type 1 weights:
   a) 30, 70, 104, 150, 200A - add 15 lbs. (6.8 kg).
   b) 400, 600, 800, 1000A - add 40 lbs. (18.1 kg).
   c) 1600A - add 60 lbs. (27 kg).
   d) 2000-3000A - Type 4 & 12 not available. (Consult ASCO)
5. When temperatures below 32° F can be experienced, special precautions should be taken, such as the inclusion of space heaters, to prevent condensation and freezing of this condensation. This is particularly important when environmental enclosures (Type 3R, 4 & 12) are ordered for installation outdoors. See page optional accessories for space heater options (acc. 44A and 44G).
6. Front connected design for 300 ONLY, 386 dimensions are: 38" (965mm)W - 91"(2311mm)H - 48"(1219mm)D.

SUGGESTED SPECIFICATION

for

Series 300 Automatic Transfer Switches

PART 1 GENERAL

1.01 Scope

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.

1.02 Acceptable Manufacturers

Automatic transfer switches shall be ASCO Series 300. 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

PART 2 PRODUCTS

2.01 Mechanically Held Transfer Switch

A. 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.

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. 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.

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.

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.

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. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal.

E. 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.

F. 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.

G. 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.

H. Engine Exerciser - An engine generator exercising timer shall be provided, including a selector switch to select exercise with or without load transfer.

I. 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.

J. 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)

K. Communications Interface - A full duplex RS485 interface to provide remote monitoring and control by ASCO communications products (Accessory 72A).

L. Programmable Engine Exerciser - A seven day electronic time switch for automatic weekly testing of the engine - generator set. The exerciser shall be fully programmable and backed up by a permanent battery. (Accessory 11CD).

M. Enclosure Heater - A 125 watt enclosure heater with transformer and thermostat (adjustable from 30° to 140 ° F) (Accessory 44 G).

N. 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:

ATS Size	Withstand & Closing Rating MCCB	W/CLF
30 – 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.