ASCO 7000 SERIES Medium Voltage Tranfer Switches









7000 SERIES MEDIUM VOLTAGE POWER TRANSFER SWITCHES

Power continuity for:

- Data Centers
- Healthcare Facilities
- Telecom Exchanges
- Industrial Complexes
- Refineries
- Manufacturing Plants
- Batch Processes
- Retail Business Centers

The availability, quality and reliability of electrical power can impact life, safety, productivity and financial success.

ASCO Power Technologies provides solutions to assure the continuity of power, from the design stage to installation, start-up and beyond: complete coverage for continuous power.

ASCO products can transform what could be a major catastrophe into complete assurance.

With a variety of configurations, options and transfer modes including open, delayed, closed and soft load transitions, the ASCO 7000 SERIES Medium Voltage Power Transfer Switches deliver per specifications and are UL 1008A listed.

Pioneering technology, unsurpassed technical support and around-the-clock service anticipate and satisfy your evolving power switching and controls requirements for optimizing power reliability.

THE INNOVATION OF ASCO MEDIUM VOLTAGE POWER TRANSFER SWITCHES



An ASCO 7000 SERIES microprocessor-based controller (Transfer Control Center) manages breaker operation to transfer critical loads between power sources.

Comprising two voltage classes, 15 kV and 5 kV, the Medium Voltage Transfer Switch may be equipped with accessories and options to meet installation requirements. Additionally, custom engineered solutions per specifications may also be accommodated. Switch mode options include open transition, delayed transition, closed transition and soft-load operation.

Assemblies consist of metal-clad construction, barriered controls, removable element circuit breakers and voltage transformers, providing functionality at the nominal amperage and voltage.

Construction, testing and safety certifications include the following standards:

- ANSI/IEEE C37.20.2 Standard for Metal-Clad Switchgear
- ANSI/NEMA C37.55 Switchgear Medium Voltage Metal-Clad Assemblies Conformance Test Procedures
- UL 1008A Listed Standard for Medium Voltage Transfer Switches

The chart below provides an overview of the different voltage, current and interrupt class ratings available.

Voltage Classes	Interrupt Classes (kA Symm.)	Rated Current (A)	Construction
15 kV	25	1200	Metal-Clad
	40	2000	Switchgear per
	50	3000	ANSI C37.20.2, UL
			1008A listed, draw-
5kV	40	1200	out vacuum circuit
	50	2000	breakers and utility
		3000	grade transformers



Quality engineered with factory tests on every assembly.



ASCO 7000 SERIES MEDIUM VOLTAGE POWER TRANSFER SWITCHES

The ASCO 7000 SERIES Medium Voltage Power Transfer Switch provides superior protection, reliability and safeguarded maintenance. Compliant standards include:

- UL Listed per UL 1008A Standard for Medium Voltage Transfer Switches
- ANSI/IEEE C37.20.2 Standard for Metal-Clad Switchgear

The Medium Voltage Power Transfer Switch is rated at 5 kV or 15 kV, with current capacities of 1200 through 3000 amperes. Available interrupt capacity options for an assembly include 25, 40 or 50 kA classes (symmetrical).

The medium voltage transfer switch basic configuration consists of two to three vertical sections, depending upon the rated current; extensive metering, relaying and/or other options may require additional sections. Basic transfer switch configurations rated at 1200 amperes consist of two sections minimum, whereas switches rated at 2000 or 3000 amperes consist of three sections minimum. Combining the sections to form a single assembly, provisions such as seismic certification, secure outdoor enclosures, and many other special requirements can also be accommodated per customer specifications.

Key components and features include:

- ASCO 7000 SERIES Transfer Control Center
- Draw-Out and Shuttered Vacuum Circuit Breakers with Optional Protective Relaying:
 - One (1) Normal Source VCB for Transfer Switch
 - One (1) Emergency Source VCB for Transfer Switch
- Two (2) Normal Source Fused Draw-Out Voltage Transformers (Open Delta)
- Two (2) Emergency Source Fused Draw-Out Voltage Transformers-(Open Delta)
- Epoxy insulated copper bus
- Protective barriers per ANSI C37.20.2 and UL 1008A to isolate major components.
- Type SIS control wire with durable printed wire markings directly on the insulation
- Fully integrated multi-section metal clad assembly



ASCO 7000 SERIES 1200 Amp Medium Voltage Power Transfer Switch



ASCO 7000 SERIES 2000-3000 Amp Medium Voltage Power Transfer Switch

ASCO 7000 SERIES MEDIUM VOLTAGE POWER TRANSFER SWITCHES

Base Model F	eatures				
Voltage	5 kV / 15 kV	5 kV / 15 kV			
Breaker Ampacity	1200 A	2000 A / 3000 A			
Number of Sections (Minimum)	2	3			
Nominal NEMA 1 Dimensions					
Footprint (per section)	36"Wx92"D	36"Wx92"D			
Height	95"H	95"H			
UL 1008A	Yes	Yes			
ANSI C37.20.2	Yes	Yes			
Seismic Certification Upon Request	Yes	Yes			
Insulated Bus	Yes	Yes			
Cable Barriers	Yes	Yes			
11 Gauge Steel (Exterior Surfaces) Draw-out Breakers	Yes	Yes			
Draw-out Breakers	Yes	Yes			
Automatic Shutters	Yes	Yes			
Grounded Barriers	Yes	Yes			
Baked Electrostatic Powder Paint	Yes	Yes			
Distribution Available	Yes	Yes			
Protective Relays Available	Yes	Yes			
NEMA 3R Non-Walk in Available	Yes	Yes			

Codes & Standards

- UL 1008A Listed Standard For Medium Voltage
 Transfer Switches
- National Electric Code (ANSI/NFPA 70)
 - Article 517 Health Care Facilities
 - Article 700 Emergency Systems
 - Article 701 Legally Required Standby Systems
 - Article 702 Optional Standby Systems
 - Article 708 Critical Operations Power Systems

Certifications

• Seismic Certification - available upon request at order entry

Arc Safety

Specifications pertaining to arc safety can include arc resistant construction and arc detection relays.

Transfer Switch Controller

The ASCO 7000 Series Transfer Control Center, providing refined and proven transfer control for low and medium voltage switches, leverages almost a century of power transfer innovation and application experience.

Circuit Breakers

Circuit breakers provide superior reliability and maintainability compared to contactors. Each circuit breaker contains three separately mounted vacuum interrupters with an integral contact wear gap indicator. Stored energy devices allow fast operation to interrupt and isolate faults.

Breakers are designed and manufactured to assure safe withdrawal for inspection and facilitate maintenance. Normal Source and Emergency Source circuit breakers are interchangeable due to identical ratings and configuration, as standard. Stored energy mechanisms include electric motor charging and manual charging handle.

Instrument Transformers

Instrument transformers include Current Transformers (CT) and Voltage Transformers (VT, a.k.a. Potential Transformers - PT) to measure circuit voltage and current. Standard construction in-cludes ANSI metering class transformers built per ANSI C57.13 to assure consistent and reliable performance. Additional VT features include grounded truck-mount to safely withdraw and facilitate maintenance, as well as fusing for circuit protection. Customer specifications requiring additional features such as revenue grade instrumentation, test blocks, and/or additional protective relaying may be accommodated as well.



The ASCO 7000 SERIES Medium Voltage Power Transfer Switches meet UL code requirements as wellas NFPA/ANSI standards.

TRANSITION OPTIONS AND CONTROL MODES

Open Transition Transfer Switching (OTTS)

ASCO Open Transition Transfer Switches feature non-overlapping breaker operation, assuring that electrical power sources remain isolated and effectively interrupting the flow of power. The switch transfers in a 'break before make' mode.

Delayed Transition Transfer Switching (DTTS)

ASCO Delayed Transition Transfer Switches provide a prescribed disconnect time for load transfers between power sources. The adjustable period of delay allows stored energy loads to dissipate power. Stored energy loads may include motors and drives, rectifier banks, power correction and filtration devices, and load management applications. Interlocking prevents direct connection of both sources to the load concurrently.

Closed Transition Transfer Switching (CTTS)

ASCO Closed Transition Transfer Switches feature overlapping breaker operation, permitting the transfer of electrical loads while maintaining electrical continuity. The switch transfers in a 'make before break' mode if all synchronization parameters for both sources are within acceptable ranges. Control logic in the ASCO 7000 SERIES Transfer Control Center monitors source conditions and automatically determines if the transfer should be open (conventional non-overlap mode) or closed transition.

Closed transition transfers within 5 electrical degrees is achieved passively, without control of the engine gen-erator set. Therefore, no additional control wire runs are required between the ATS and engine generator set governor or voltage regulator. Prescribed overlap time in a closed transition transfer typically occurs within 100 milliseconds.

Soft Load Operation and Transfer

In addition to functioning as an automatic transfer switch, ASCO Soft Load Transfer Switches provide source paralleling for continuous power load transfers, peak shaving, load curtailment and export/import control. Controls include active synchronization and power factor control via engine generator interfaces to the governor and voltage regulator.

Automatic and Manual Control Modes

The mode selector switch allows the user to select between automatic and manual control modes. Automatic control options include open, delayed and closed transition as well as soft load control. Electrically interlocked manual controls on the front door permit safe, user-supervised operation in non-automatic mode.

Breaker Control Switch



Allows the operator to trip the breaker in any control mode

Allows the operator to close the breaker in manual mode with interlock protection

"Trip", "Close", and "Pull to Lock"handle positions

Indicator LEDs: Closed = Red Open = Green Tripped = Amber (protective relaying option)



Mode Selector Switch



The mode selector switch allows the user to select between automatic and manual control modes.

Every circuit breaker includes, on the front door of its compartment, a breaker control switch for manually opening and closing the circuit breaker when the system is in manual mode. Electrical interlocks prevent simultaneous closure of Normal and Emergency source breakers. Manual trip of Normal and Emergency source breakers functions in both automatic and manual modes.

OPTIONS AND SPECIFIED COMPONENTS

Protective Relays

Protective relays address circuit protection and coordination requirements not typically included in the scope of a transfer switch. Examples of circuit protection include:

- ANSI Device 32 Directional Power
- ANSI Device 50 Instantaneous Overcurrent
- ANSI Device 51 AC Inverse Time Overcurrent
- ANSI Device 46 Reverse Phase/Phase-Balance Current
- ANSI Device 47 Phase Sequence/ Phase-Balance Voltage

An additional relay device, ANSI Device 86 – Lockout, assures fault acknowledgement by locking a breaker open after a fault trip. The lockout relay, once a fault trip occurs, requires manual intervention to reset the trip condition and allow the breaker to resume automatic control.

In addition to adjustable protection parameters, protective relays additionally facilitate the implementation of complex coordination requirements by allowing sophisticated trip curve tuning.

The ASCO 7000 SERIES Medium Voltage Power Transfer Switch includes standardized selections of protective relay options. Customer requirements of additional protective relaying may also be specified.

Communication and Connectivy

ASCO offers flexible and sophisticated communication options including a variety of technologies and protocols to meet connectivity requirements. Examples of peer and client/server communication options include RS-485 and Ethernet connectivity and Modbus ™ protocols.

Additional capabilities include web servers, gateways and managed networks.

The ASCO Power Manager XP provides additional communication, protection and metering capabilities for normal and emergency sourcing as well as loads, particularly useful for metering total power, generator and utility, delivered to the load.

Power Monitoring

Power monitoring systems, commonly employed at many facilities with sophisticated power distribution, provide a focal point for systematic alarming, reports, control, diagnostic and operational information. As these systems become more sophisticated, providing analytical services such as operational evaluations and service scheduling, the importance of connectivity escalates.

Instrumentation, Control and Metering

With over a century of innovative firsts, ASCO excels in analog and digital instrumentation, controls and metering for electrical equipment. Specified items can include:

- PowerQuest[®] Critical Power Management Systems (CPMS)
- Analog and/or digital metering: current, voltage, power, power factor, frequency.
- Discrete indicator lights for status and control information at a glance
- Multi-ratio PTs and CTs
- Color touch screen interface



The ASCO 7000 SERIES Medium Voltage Power Transfer Switch includes the advanced 7000 SERIES Transfer Control Center, vacuum circuit breakers from leading manufacturers, utility grade instrumentation transformers and optional protective relays.



POWER CONTROL CENTER

7000 SERIES Transfer Control Center

The ASCO 7000 SERIES Transfer Control Center provides power transfer control to low voltage power transfer switches up to 4000 amperes and medium voltage power transfer switches up to 3000 amperes.

Leveraging ASCO's history and experience, the controller combines state-of-the-art microprocessor technology, superior noise immunity and advanced data computation and evaluation algorithms. It represents the standard for digital transfer switch technology to which all others are measured, processing voltage, current and frequency data, excelling in control logic, and reporting status and diagnostic information with real-time urgency.



7000 SERIES Transfer Control Center Surge **Specifications**

Emission Standard - Group 1, Class A	EN 55011				
Generic Immunity Standard	EN 50082-2				
Electrostatic Discharge (ESD) Immunity	EN 61000-4-2				
Radiated Electromagnetic Field Immunity	ENV 50140				
Radiated RF Electromagnetic Field Immunity	EN 61000-4-3				
Electrical Fast Transient (EFT) Immunity	EN 61000-4-4				
Surge Transient Immunity	EN 61000-4-5				
Conducted Radio-Frequency Field Immunity	EN 61000-4-6				
Voltage Dips, Interruptions and Variations Immunity	EN 61000-4-11				

Microprocessor Controller

ASCO 7000 SERIES TRANSFER CONTROL SYSTEM

Voltage and Frequency Sensing

- Under- and over-voltage settings on normal and emergency sources
- Under- and over-frequency settings on normal and emergency
- True RMS voltage sensing with +/- 1% accuracy
- Frequency sensing with +/- 0.2% accuracy
- Phase sequence sensing for phase sensitive loads
- Voltage unbalance detection between phases
- Frequency differentials and voltage differentials

Status and Control Features

- Output contact (N/O or N/C) for engine-start signals
- Selection between "commit/no-commit" on transfer to emergency after engine start and normal restores before transfer
- Event log displays 99 logged events with time/date stamp, event type and event reason
- Optional output signals for remote indication of normal and emergency source acceptability
- Statistical system monitoring data screens which provide:
 - Total number of transfers
 - Number of transfers caused by power source failure
- Total number of days the transfer switch has been in operationTotal number of hours that the normal and emergency sources
- have been available

Features

- Digital microprocessor.
- Touch pad programming of features and settings without the need for meters or variable power supplies.
- On-board diagnostics provide status panel, integrated display and communication interface with system status and performance information.
- Displays and counts down active timing functions.
- Selectable multilingual display including English, German, Portuguese, Spanish, French and others upon request.
- Password protection to prevent unauthorized tampering with settings.
- Remote monitoring and control with ASCO PowerQuest[®] communications products.
- Historical event log.
- Statistical system monitoring information available via integrated display and communication interface.

Time Delays

- Engine start time delay adjustable from 0 to 6 seconds delays engine starting signal to override momentary normal source loss
- Transfer to emergency time delay adjustable from 0 to 60 minutes
- Emergency source stabilization time delay adjustable from 0 to 6 seconds ignores momentary transients during initial generator set loading
- Retransfer to normal time delay with two settings:
 - Power failure mode adjustable from 0 to 60 m
 - Test mode adjustable from 0 to 10 h
- Unloaded running time delay adjustable from 0 to 60 minutes provides engine cool-down time before shutting down the engine
- Pre- and post-transfer signal time delay adjustable from 0 to 5 minutes is for selective load disconnect with a programmable bypass on source failures This signal can be used to drive a customer furnished relay, or optionally specify accessory 31Z for two (2) sets of double throw contacts rated 3 amperes at 480 volts AC
- Fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi-weekly or monthly basis.
- • Closed transition transfer time delays include:
 - In-synch time delay adjustable from 0 to 3 s
 - Failure to synchronize adjustable from 1 to 5 m
 - Extended parallel adjustable from 0.1 to 1.0 s
- Delayed transition load dis-connect time delay adjust-able from 0 to 5 minutes disconnects the load for the set period of time between power transfers (normal to emergency, or emergency to normal)

ASCO 7000 SERIES MEDIUM VOLTAGE POWER TRANSFER SWITCH

ASCO Power products are designed to be the world's most robust, intelligent and advanced power transfer and control system with extensive diagnostic capabilities. The 7000 SERIES Medium Voltage Transfer Switch is engineered to safely provide continuous power in the widest range of emergency and standby power applications including industrial, commercial and business-critical facilities as well as health care campuses.

Manufactured and tested to exacting specifications, features include electrostatically applied powder coating for superior adhesion and protection, wiring harnesses with quick-lock plugs for easy removal of components or door assemblies for maintenance or upgrades and epoxy-coated bus. Additionally, factory-trained service and support is available 24 hours a day, 7 days a week – continuous coverage for continuous power. Subjected to stringent testing, the medium voltage power transfer switch meets or exceeds UL, ANSI, IEEE and NEMA standards and includes independent certifications from safety and seismic test laboratories.

ASCO Medium Voltage Transfer Switches Ordering Information

	Medium Voltage Transfer Switch Catalog Numbers																							
In I	nterrupt Rating	P	roduct Series	(Operation type	Т	ransition type	C	onstruction		Device Type	N	eutral Гуре		Poles	Rated current (Amperes)	١	/oltage Rating	С	ontroller	1	Accessories	sories Enc	
A B C	25 kA IC 40 kA IC 50 kA IC	7	7000 SERIES	AN	Automatic Non- Automatic	O C D S	Open Closed Delayed Softload	T L G P	Transfer (Non-Soft Load) Soft Load Transfer (N)Service Entrance (E) Service Entrance (N+E) Service Entrance	М	Dual CB Transfer Switch	OA	None Solid	3	Poles	1200 2000 3000	T U V W X Z 3 6 7 8 9 0	2400 V 4160 V 11,000 V 12,470 V 13,200 V 14,400 V 3,300 V 6,600 V 7,200V 10,000V 13,800V Other	5	7000 SERIES Transfer Control Center	z	Per Accessory Number Per Specification	C M	NEMA1 NEMA 3R (Secure)

ASCO Medium Voltage Transfer Switches Accessories

1G	External 24VDC auxiliary power connections (Standard on MVATS)						
18B	2 pole D/T contacts that operate when emergency source voltage is present						
18G	2 pole D/T contacts that operate when normal source voltage is present						
30B	Load shed circuit						
31Z	Selective load disconnect circuit						
85L	Power Manager w/ Display on Load						
138B	TOC Breaker Truck Operated Contact Switch						
136A	3" Infrared Viewports						
140	Power Quality Meter (customer to specify model, optional display, and connection N-E-L) Distribution, Intermediate and Utility Class Lightning Arrestors require customer specifications						

Note: Distribution, intermediate and utility class lightning arrestors require customer specifications.



Throughout your business cycles, from design to post-installation service and support, ASCO provides unparalleled assistance to navigate through each step of the process and achieve your goals

COMPARE TECHNOLOGY, SUPPORT AND SERVICE

When evaluating manufacturers, compare their technology, technical support and service.

Technology

ASCO is the world's largest manufacturer of world-class power transfer technology.

ASCO **innovation** delivers more than 100 million kilowatts every day. Reliably. Repeatedly.

ASCO commercialized the first power transfer switch in 1920. Today, ASCO innovations stand as milestones in power transfer.

As with ASCO Low Voltage Power Transfer Switches, ASCO Medium Voltage Power Transfer Switches optimize reliability and total cost of ownership.

ASCO integrated systems are the benchmark for reliability, configurability and reduced maintenance.

Specify exactly the medium voltage transfer switch capabilities you need. With so much at stake, protect your facility's businesscritical continuity, and your reputation.

Support

ASCO Support defines **collaboration**, comprising highly-skilled teams of factory-based and geographically dispersed applications engineers and project managers.

Properly specifying medium voltage power transfer switches demands a thorough understanding of a range of issues and challenges.

A team assigned to your project will work with you every step of the way, from design to commissioning.

It's our support that separates ASCO from the competition.

We will help you develop solutions that reduce installation costs, save time, improve operating efficiency, conserve utility and maintenance costs, and provide complete life cycle management, including upgrades and retrofits.

Service

ASCO Services comprises more than 125 nationwide service technicians, product specialists and engineers. Partnering with more than 450 factory-trained and authorized service representatives, ASCO provides unparalleled **assurance** worldwide.



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