Zenith Automatic Transfer Switches

Withstand and Closing Ratings (WCR)

The Purpose of Testing and Unit Ratings

ABB automatic transfer switches (ATS) have been subjected to an extensive test program to show that they comply with and exceed UL 1008 standards as well as the various performance specifications used by most government agencies and major electrical engineers throughout the world. The primary test to assure the dependability of an automatic transfer switch is its ability to close into and withstand high fault currents. The purpose of this publication is to provide basic information on withstand ratings and to document the ratings that ABB ATS currently holds under UL 1008

NFPA 110 Standard for Emergency and Standby Power Systems, Section 6.3.2, requires that the capacity and rating of automatic transfer switches be adequate to withstand the thermal and electromagnetic effects of short circuit currents that may arise in the electrical system. It is important to be able to compare properly the withstand close rating (WCR) of the switch to the available short circuit (fault) current of the system until the protective device clears the fault

If a transfer switch does not have adequate withstand capability—system failure, fire, injury to personnel or equipment damage may result. A clear understanding of the interrelationship between the protective device, transfer switch and system needs is necessary for a well designed installation. Some basic information on withstand rating terms and calculations follows the enclosed rating charts.

Underwriters Laboratories (UL) is the independent testing body that has developed the standard UL 1008 which all major transfer switch manufacturers test to. UL lists products which have successfully passed a battery of witnessed tests including the withstand and close into fault tests described herein. Manufacturers that complete these tests are then permitted to label their products with the UL mark.

UL made changes in April of 1989 regarding the labeling requirements of transfer switches. UL clarified the labeling procedure and allows for three rating categories.

- Current limiting fuse
- Specific class (trip time) of molded case breaker
- “Umbrella” or “Any Breaker” ratings that take into account all types of molded, insulated case and power circuit breakers; these tests are performed for a duration of 50ms (3 cycles) on units 225 amps and greater, and for 25ms (1.5 cycles) on 40-150 amp units (with an optional 50ms (3 cycles) duration for units up to 150 amps; note the 50ms (3 cycles) rating on 150 amp and below units is optional as UL has determined that all breakers in this size clear in less than 25ms (1.5 cycles). The “Umbrella” or “Any Breaker” rating is therefore the actual UL requirement and definition of the ATS industry 50ms (3 cycles) (or 25ms (1.5 cycles) as noted) withstand and closing rating, and should not to be confused with additional, non UL 1008 labeled “withstand only” tests.

As per UL 1008 7th edition which became effective from Nov 1st, 2014, “Any Circuit Breaker” rating is replaced by “time based” rating and marking will shows in second instead of # of cycles.

Another major change was implemented in UL 7th edition for Specific Breaker Certification. Per the new requirement, the circuit breaker must be tested with a transfer switch in order to be added to the approved breaker list. The new breaker can also be added to the approved breaker list if the fault clearing time from the published trip curve indicates that the new breaker will clear a fault in the same amount or less time than the time required to clear a fault using the breaker that was tested with the transfer switch successfully.

Zenith Product Ratings

The ABB family of transfer switches have maintained an industry-leading role in ratings from the time of its introduction. Today all ZTS, ZTE, and ZT30 products are labeled with a time based rating as well as some higher specific breaker levels giving the consultant a free hand with system design. The following pages include the UL certified ratings and specific breaker coordination charts, withstand rating data and additional specific information.

The consulting engineer must review the time and rating to specify the breaker, care must be taken to assure that the breaker specified for the installation have an equal or shorter trip time when compared to the listed devices. This would limit the application of the switch to projects within the scope of its specific breaker listing.

In addition to this factor, many transfer switch manufacturers perform additional withstand tests on selected products. These additional tests may be either for a higher current value or a longer duration than their standard UL listed ratings. The consultant must determine the applicability of these tests and take careful note if these levels are normally not UL labeled ratings.

The ZTS/ZTG/ZTE
Switch Families

- **ZTS/ZTE** Automatic Transfer Switches 40 - 4000 amps
- **ZTSD/ZTED** Delayed Transition Switches 40 - 4000 amps
- **ZTSCT/ZTECT** Closed Transition Switches 100 - 4000 amps
- **ZBTS/ZBTE** Transfer/Bypass Switches 100 - 4000 amps
- **ZBTSD/ZBTED** Delayed Transfer/ Bypass Switches 100 - 4000 amps
- **ZBTSCT/ZBTECT** Closed Transition Transfer/ Bypass Switches 100 - 4000 amps
- **ZTG** Automatic Transfer Switches 40 - 3000 amps
- **ZTGD** Delayed Transition Switches 40 - 3000 amps
- **ZTGSE/ZTGDSE** Standard & Delayed Service Entrance Rated Switches 40 - 3000 amps
- **ZTX** Automatic Transfer Switches 40 - 400 amps
- **ZBT30** ATS/ Bypass 1000 -3000A
- **ZBT30D** Delayed Switches 1000 - 3000A
- **ZBT30CT** Closed TransitionSwitch 1000 - 3000A

Note: This document excludes ratings for the ZTX and ZTG series, powered by TruONE. For WCR ratings on those products, refer to document number 1SCC303020C0201.

Definitions & Calculations

Purpose

Many questions arise when comparing WCR to the system fault current rating. Too often a switch is rated by a manufacturer in one set of WCR terms and the available system fault currents described with a different set of terms. The purpose of this paper is to outline the different ways switches may be rated (WCR) and systems are measured.

Basic Definitions

- RMS Current – The Root Mean Square which is the effective value of an alternating current. It is equal to .707 of the peak current for a sine wave. This is the value referred to when people say “current.”
- Peak Current – The instantaneous maximum value of current—the peak current of a sine wave is 1.414 times its RMS value.
- Symmetrical Current – The alternating current which is symmetrical around the zero axis of the sine wave.
- Asymmetrical Current – The alternating current which is not symmetrical around the zero axis.
- Peak Fault Current – The instantaneous maximum current value that occurs after the start of a fault in any phase.
- Available Peak Current – Maximum possible short circuit current that may exist in a system without protective devices.
- Peak Let Through Current – Maximum instantaneous current through the protective device during the total clearing time.
- Withstand Current Rating – The rating that defines the ability of the switch to withstand the thermal and electromagnetic effects of short circuit currents for a set period of time.
- Withstand and Closing Rating (WCR) – UL 1008 test for a transfer switch’s ability to close into and withstand a fault current. These are the ratings which will actually appear on the UL label of the product.
- Short-Time current rating (STR) - UL 1008 test similar to withstand and closing rating but for a time period up to 0.5 seconds and provides for the requirement that the switch be capable of carrying full load current after the withstand and close-on short-circuit events.

Definitions & Calculations

Test Documents

As fault currents can occur at any level, a transfer switch must be capable of withstanding any fault current up to its maximum rating. This rating is based on the rating of the protective device in front of the unit and must be considered on that basis.

ABB tests show results based on various current values and time durations, and include additional high current tests with fuses. By considering this range of values, it is possible to predict performance with different fuse characteristics or specific circuit breaker current-time curves with a given available short circuit current.

Interrupting Ratings

Some manufacturers of circuit breaker type automatic transfer switches list interrupting current (IC) ratings in lieu of WCR. These switches will then open on faults instead of withstanding the fault until the external protective device clears. As the transfer switch is then used to open the fault current in place of a protective device—this may leave the transfer switch with both normal and emergency open which then requires manual resetting of the breakers within the transfer switch enclosure. The circuit breakers may require factory inspection after high current interruption in accordance with common circuit breaker procedures.

WCR ratings, as opposed to IC ratings appear to offer a better choice to the system designer as he attempts to coordinate the protection of the entire system. Knowing the maximum amount and duration of fault current a switch will withstand gives the designer the information necessary for complete coordinated system design.

Advantage of RMS Symmetrical Ratings

- Date is consistently reported based on UL test procedures.
- Where time beyond the first ½ cycle is given suitable decisions can be made to use circuit breakers or fuses.
- Misleading reporting is eliminated

Blow-On Effects on Short Circuit Current in Contacts

Some switch designers analyze “blow-on” and “blow-off” effects and force vectors (due to electromagnetic repulsion) to claim increased WCR capability of their product. Such calculations are very rough approximations because of inherent errors in estimating “domain” size and number, current “pinch” effect and the problem of complex geometry of actual contact structures when compared to idealized models. The only proof of a successful design are tests, uniformly performed and consistently reported all to the same criterion such as UL 1008.

Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTX (40-225A) ZTG (OT) (40-225A) ZTS (OT) (40-150A) ZTE (OT) (40-150A)	40 80 100 150 200 225	-	10 000 0.025 Sec	480V	150 000	ABB	125A	XT2	200 000 NOTE 2 (Class J)	400A
					65 000		125A	XT1		
							250A	XT4		
							400A	XT5		
					30 000	Eaton	100A	FCL		
							250A	JGS, JGH, JGC, JGU, JGX, JBD, JD, HJD, JDC, LCL, LCLA		
							400A	LDC, CLDC, KDB, KD, HKD, KDC, LD, CLD, HLD, CHLD		
						ITE/ Siemens	125A	CED6, HED4, HED6		
							250A	CFD6, FD6A, FXD6, HFD6, HFXD6, HHFD6, HHFXD6		
							400A	CJD6		
						GE	150A	SEL, SEP, THLC1,		
							225A	THLC2		
							250A	SFH, SFL, SFP		
							400A	SGH, SGL, SGP, FGN, FGH, FGL, FGP,		
						ABB	225A	XT3		
						Schneider	150A	HG, HJ, HL, HR		
							250A	JJ, JL, JR		
							400A	copy		
				600V	22 000	Eaton	250A	JGS, JGH, JGC, JGU, JGX, JDB, JD, HJD, JDC, LCL, LCLA		
							400A	LDC, CLDC, KDB, KD, HKD, KDC, LD, CLD, HLD, CHLD		
						ITE/ Siemens	125A	CED6, HED4, HED6		
							250A	CFD6, FD6, FXD6, HFD6, HFXD6, HHFD6, HHFXD6		
						GE	150A	SEL, SEP, THLC1,		
							225A	THLC2		
							250A	SFH, SFL, SFP		
							400A	SGH, SGL, SGP, FGN, FGH, FGL, FGP		
						ABB	125A	XT1		
							250A	XT4		
							400A	XT5		
					42 000		125A	XT2		
					22 000	Schneider	150A	HG, HJ, HL, HR		
							250A	JJ, JL, JR		
							400A	LG, LJ, LL, LR		

See page 17 for note details

Coordinated Breaker Model Types

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ZTG (OT) (260A)	260	-	-	480V	15 000	ABB	125A	XT2	-	-
					65 000		125A	XT1		
							250A	XT4		
							400A	XT5		
					35 000	Eaton	250A	JGS, JGH, JGC, JGU, JGX, JDB, JD, HJD, JDC, LCL, LCLA		
							400A	LDC, CLDC, LD, CLD, HLD, CHLD, KDB, KD, HKD, KDC		
						ITE/ Siemens	125A	CED6, HED4, HHED6		
							250A	CFD6, FD6, FXD6, HFD6, HFXD6, HHFD6, HHFXD6		
						GE	150A	SEL, SEP, THLC1,		
							225A	THLC2		
							250A	SFH, SFL, SFP		
							350A	SGH		
							400A	SGH, SGL, SGP, FGN, FGH, FGL, FGP		
						Schneider	150A	HG, HJ, HL, HR		
							250A	JJ, JL, JR		
							400A	LG, LJ, LL, LR		

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Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTX (300-400A) ZTG (OT) (400A) ZTG (DT) (40-400A) ZTS (OT) (225-400A) ZTS (DT, CT) (40- 400A) ZBTS (OT, DT) (100-400A) ZTE (OT) (225-400A) ZTE (DT, CT) (40-400A) ZBTE (OT, DT) (100-400A)	40 80 100 150 200 225 260 300 400	-	35 000 0.050 Sec	240V	150 000	ABB	125A	XT2	200 000 (Class J) 100 000 (Class RK5, RK1)	600A
							250A	XT4		
					100 000		125A	XT1		
							600A	XT5		
					65 000		225A	XT3		
					65 000	Schneider	600A	LJ. LL. LR		
					65 000	GE	150A	SEL, SEP		
							250A	SFL, SFP		
							400A	SGL, SGP		
							600A	SGL, SGP, FGL, FGP		
				480V	125 000	ABB	250A	XT4		
					150 000		125A	XT2		
					100 000		600A	XT5		
					65 000		125A	XT1		
					50 000	Eaton	250A	HJD, JDC, JGC, JGH, JGU, JGX		
							400A	CHLD4, CLD, HLD4, CLDC, LDC, KDC, HKD, CHMDL4, CMDL4		
							600A	CHLD6, HDL6, CHMDL6, CMDL6, CLDC, CLD6, LDC6, CLDC6		
							800A	CHMDL8, HMDL8, MDL8, CMDL8		
					50 000	ITE/ Siemens	250A	CFD6, HFD6, HFXD6, HHFD6, HHFXD6		
							400A	CJD6		
							600A	CLD6, HHLD6, HHLXD6, HLD6, HLXD6		
							800A	CMD6, MD6, HMD6, HMXD6 MXD6		
					50 000	GE	150A	SEL, SEP		
							250A	SFL, SFP		
							400A	SGL, SGP		
							600A	SGL, SGP, FGL, FGP		
					50 000	Schneider	150A	HJ, HL, HR		
							250A	JJ, JL, JR		
							600A	LJ, LL, LR		
							800A	MJ		

600V rating is shown on next page

See page 17 for note details

Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTX (300-400A) ZTG (OT) (400A) ZTG (DT) (40-400A) ZTS (OT) (225-400A) ZTS (DT, CT) (40-400A) ZBTS (OT, DT) (100-400A) ZTE (OT) (225-400A) ZTE (DT, CT) (40-400A) ZBTE (OT, DT) (100-400A	40 80 100 150 200 225 260 300 400	-	35 000 0.050 Sec	600V	42 000	Eaton	250A	JGU, JGX	200 000 NOTE 3 (Class J)	600A
							400A	CLDC4, KDC, LDC4		
							600A	CLDC6, LDC6, NB Tri-Pac		
							800A	NB Tri-Pac		
						ITE/ Siemens	250A	CFD6		
							400A	CJD6, SCLD6		
							600A	CLD6, HHLD6, HHLXD6, SCLD6		
							800A	CMD6, HMD6, HMXD6, SCMD6, SHMD6		
						GE	150A	THLC1		
							250A	FGL4, FGP4, THLC4, TLB4		
							400A	FGL4, FGP4, THLC4, TLB4		
							600A	SGL, SGP, FGL6, FGP6		
							800A	SKL8, SKP8		
					42 000	ABB	125A	XT2		
					65 000		250A	XT4		
					100 000		600A	XT5		
					42 000	Schneider	150A	HJ, HL, HR		
							250A	JJ, JL, JR		
							600A	LJ, LL, LR		
							800A	MJ		

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ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTG (OT, DT)	600	-	-	240V	150 000	ABB	125A	XT2	-	-
							250A	XT4		
					100 000		125A	XT1		
							600A	XT5		
					65 000	Schneider	600A	LJ. LL. LR		
						GE	150A	SEL, SEP		
							250A	SFL, SFP		
							400A	SGL, SGP		
							600A	SGL, SGP, FGL, FGP		
						ABB	225A	XT3		
				480V	50 000	Eaton	250A	HJD, JDC, JGC, JGH, JGU, JGX		
							400A	CHLD4, CLD, HLD4, CLDC, LDC, KDC, HKD, CHMDL4, CMDL4		
							600A	CHLD6, HDL6, CHMDL6, CMDL6, CLDC6, LDC6, CLDC6		
							800A	CHMDL8, HMDL8, MDL8, CMDL8		
						ITE/ Siemens	250A	CFD6, HFD6, HFXD6, HHFD6, HHFXD6		
							400A	CJD6		
							600A	CLD6, HHLD6, HHLXD6, HLD6, HLXD6		
							800A	CMD6, MD6, HMD6, HMXD6, MXD6		
						GE	250A	SFL, SFP		
							400A	SGL, SGP		
							600A	SGL, SGP, FGL, FGP		
					65 000	ABB	125A	XT1		
					150 000		125A	XT2		
					125 000		250A	XT4		
					100 000		600A	XT5		
					50 000	Schneider	150A	HJ, HL, HR		
							250A	JJ, JL, JR		
							600A	LJ, LL, LR		
							800A	MJ		

600V rating is shown on next page

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Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTG (OT, DT)	600	-	-	600V	42 000	Eaton	250A	JGU, JGX	-	-
							400A	CLDC4, KDC, LDC4		
							600A	CLDC6, LDC6, NB Tri-Pac		
							800A	NB Tri-Pac		
						ITE/ Siemens	250A	CFD6		
							400A	CJD6, SCLD6		
							600A	CLD6, HHLD6, HHLXD6, SCLD6		
							800A	CMD6, HMD6, HMXD6, SCMD6, SHMD6		
						GE	150A	THLC1		
							400A	FGL4, FGP4, THLC4, TLB4		
							600A	SGL, SGP, FGL6, FGP6, PG_L, PG_P		
							800A	SKL8, SKP8		
					42 000	ABB	125A	XT2		
					65 000		250A	XT4		
					100 000		600A	XT5		
					42 000	Schneider	150A	HJ, HL, HR		
							250A	JJ, JL, JR		
							600A	LJ, LL, LR		
							800A	MJ		

See page 17 for note details

Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTS (OT, DT, CT) ZBTS (OT, DT) ZBTS (CT) (100-600A) ZTE (OT, DT, CT) ZBTE (OT, DT) ZBTE (CT) (100-600A)	600	-	50 000 0.050 Sec	480V	65 000	Eaton	600A	HLD, CHLD, LDC, CLDC	200 000 (Class L, J, RK5, RK1)	750A
							800A	HMDL, HMDLB, CHMDL, NB Tri Pac, NGH, NGC		
							1200A	NGH, HND, CHND		
							1600A	RGH		
						ITE/ Siemens	600A	CLD6, SHLD6, SCLD6, HLD6, HLDX6, HHLD6, HHLXD6		
							800A	CMD6, HMXD6, HMD6, SCMD6, SHMD6, SCND6, SHND6		
							1200A	HND6, HNXD6, CND6		
							1600A	HRD6, HRXD6		
						GE	600A	SGH, SGL, SGP		
							1200A	SKL, SKP, SKT, SKS		
					100 000	ABB	600A	XT5		
					65 000		800A	XT6		
					65 000		1200A	XT7		
					65 000	Schneider	600A	LJ, LL, LR		
							1200A	PJ		
							1600A	MASTERPACT NW		
			42 000 0.050 Sec	600V	50 000	Eaton	600A	LDC, CLDC	150 000 NOTE4 (Class L, J, RK5, RK1)	750A
							800A	NB Tri-Pac, DSL206		
						Schneider	600A	LI, LXI		
							800A	NC, NE, NX		
							1200A	PK		
						ITE/ Siemens	600A	CLD6, HHLD6, HHLXD6, SCLD6, SHLD6		
							800A	CMD6, HMD6, SCMD6, SCND6, SHMD6, SHND6		
							1200A	CND6, SCND6		
						GE	600A	TB6, SGL6, SGP6		
							800A	TB8, THP, THC, SKP8		
							1200A	SKP		
					100 000	ABB	600A	XT5		
					35 000		800A	XT6		
					50 000		1200A	XT7		

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Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR)) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTG (OT, DT) ZTS (OT, DT, CT) ZTE (OT, DT, CT)	800	-	50 000 0.050 Sec	480V	65 000	Eaton	600A	HLD, CHLD, LDC, CLDC	200 000 (Class L)	1200A
							800A	HMDL, HMDLB, CHMDL, NB Tri Pac, NGH, NGC		
							1200A	NGH, HND, CHND		
							1600A	RGH		
						ITE/ Siemens	600A	CLD6, SHLD6, SCLD6, HLD6, HLDX6, HHLD6, HHLXD6		
							800A	CMD6, HMXD6, HMD6, SCMD6, SHMD6, SCND6, SHND6		
							1200A	HND6, HNXD6, CND6		
							1600A	HRD6, HRXD6		
						GE	600A	SGH, SGL, SGP, PG_N, PG_H, PG_L, PG_P		
							1200A	SKL, SKP, SKT, SKS		
					100 000	ABB	600A	XT5		
					65 000		800A	XT6		
					65 000		1200A	XT7		
					65 000	Schneider	600A	LJ, LL, LR		
							1200A	PJ		
							1600A	MASTERPACT NW		
			42 000 0.050 Sec	600V	50 000	Eaton	600A	LDC, CLDC	-	-
							800A	NB Tri-Pac, DSL206		
						Schneider	600A	LI, LXI		
							800A	NC, NE, NX		
							1200A	PK		
						ITE/ Siemens	600A	CLD6, HHLD6, HHLXD6, SCLD6, SHLD6		
							800A	CMD6, HMD6, SCMD6, SCND6, SHMD6, SHND6		
							1200A	CND6, SCND6		
						GE	600A	TB6, SGL6, SGP6		
							800A	TB8, THP, THC, SKP8		
							1200A	SKP		
					100 000	ABB	600A	XT5		
					35 000		800A	XT6		
					50 000		1200A	XT7		

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Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZBTS (OT, DT, CT) ZBTE (OT, DT, CT)	800	-	50 000 0.050 Sec	480V	85 000	Eaton	1600A	PB, HND	200 000 (Class L)	3000A
						ITE/ Siemens	800A	CMD6		
							1200A	CND6		
							1600A	CPD6-HPD6		
						GE	1200A	SKL, SKP, SKS		
						ABB	1200A	XT7		
					65 000	ABB	800A	XT6		
						Schneider	1200A	PJ		
						Eaton	800A	HMDL. HMDLB, CHMDL, NB TRI PAC, NGH, NGC		
							1200A	NGH, HND, CHND		
							1600A	RGH		
			42 000 0.050 Sec	600V	65 000	Eaton	800A	NB Tri Pac	-	-
							1600A	RDC, CRDC, PC, PCC, PB Tri Pac		
						Schneider	1200A	NC, NE, NX		
							1600A	PCF, PEF, PHF, PXF		
						ITE/ Siemens	800A	CMD6, SCMD6		
							1200A	CND6, SCND6		
							1600A	CPD6, HPD6, HRD6		
						GE	800A	THP, THC, TB8, SKP8		
							1200A	SKP		
							1600A	THP, THC, TRP		
						MG	1600A	MP16H1, MP16H2, MC16H1		
					35 000	ABB	800A	XT6		
					65 000		1200A	XT7		

See page 17 for note details

Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTG (OT, DT) ZTS (OT, DT, CT)	1000 1200	-	50 000 0.050 Sec	480V	85 000	Eaton	1600A	PB, HND	200 000 (Class L)	3000A
						ITE/ Siemens	800A	CMD6		
							1200A	CND6		
							1600A	CPD6-HPD6		
						GE	1200A	SKL, SKP, SKS		
						ABB	1200A	XT7		
					65 000	ABB	800A	XT6		
						Schneider	1200A	PJ		
						Eaton	800A	HMDL. HMDLB, CHMDL, NB TRI PAC, NGH, NGC		
							1200A	NGH, HND, CHND		
							1600A	RGH		
ZBTS (OT, DT, CT) ZTE (OT, DT, CT) ZBTE (OT, DT, CT)			42 000 0.050 Sec	600V	65 000	Eaton	800A	NB Tri Pac	-	-
							1600A	RDC, CRDC, PC, PCC, PB Tri Pac		
						Schneider	1200A	NC, NE, NX		
							1600A	PCF, PEF, PHF, PXF		
						ITE/ Siemens	800A	CMD6, SCMD6		
							1200A	CND6, SCND6		
							1600A	CPD6, HPD6, HRD6		
						GE	800A	THP, THC, TB8, SKP8		
							1200A	SKP		
							1600A	THP, THC, TRP		
						MG	1600A	MP16H1, MP16H2, MC16H1		
					35 000	ABB	800A	XT6		
					65 000		1200A	XT7		

See page 17 for note details

Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR))	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTG (OT, DT)	1600 2000 2600 3000	65 000* 0.50 Sec	100 000 0.050 Sec	480V	100 000	Any Breaker	-	Any Breaker	200 000 (Class L)	2500A
ZTS (OT, DT, CT)			85000 0.050s	600V	85 000	Any Breaker	-	Any Breaker	-	-
ZBTS (OT, DT, CT)		-	65 000 0.050 Sec	600V	65 000	Any Breaker	-	Any Breaker	-	-
ZTE (OT, DT, CT)										
ZBTE (OT, DT, CT)										

*This rating only applies to Non-bypass ATS product

See page 17 for note details

Coordinated Breaker Model Types

ABB Zenith Model Family	Amp	UL Short-Time Rating (STR)	Any Breaker Rating (A) (WCR) Note 1	Max Voltage	Max Coordinated Breaker Rating (A)	Breaker Mfr	Max Breaker Amperage	Breaker Type	Current Limiting Fuse Rating (A)	Max Fuse Size
ZTS (OT, DT, CT)	4000	-	100 000 0.050 Sec	480V	100 000	Any Breaker	-	Any Breaker	200 000 (Class L)	6000A
ZBTS (OT, DT, CT) ZTE (OT, DT, CT) ZBTE (OT, DT, CT)			85 000 0.050 Sec	600V	85 000	Any Breaker	-	Any Breaker	200 000 (Class L)	6000A

Note 1: The Any Breaker rating is not applicable to ZTX and ZTG products.
Note 2: Fuse Rating does not apply to 200 & 225A @ 600V ATS product
Note 3: Fuse Rating does not apply to 100-400A @ 600V Bypass product
Note 4: Fuse Rating does not apply to 600A @ 600V Bypass product
Note 5: For 1600-3000A Horizontal Bypass product @ 600v

UL References:
E23911 : ZTX, ZTG, ZTS, ZTE, ZT3
E67544 : ZBTS, ZBTE, ZBT3

Legand:
OT : Open Transition
DT : Delayed Transition
CT : Closed Transition

Each ATS has Rating Label per UL 1008 Marking
Requirements as Shown in Fig1.

600-800 AMPS
TRANSFER SWITCH EQUIPMENT TYPE A(PC)

FOR USE ON EMERGENCY OR STAND-BY SYSTEMS RATED FOR TOTAL SYSTEM OR MOTOR LOADS

Suitable for control of motors, electric, discharge lamps, tungsten filament lamps and electric heating equipment where the sum of motor full-load ampere ratings and the ampere rating of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of switch rating.
Rated Frequency: 50/60 Hz
IEC Utilization Category: 32A, 32B

TIME BASED SHORT CIRCUIT RATING

SHORT-CIRCUIT RATING

When protected by a circuit breaker, this Transfer Switch is suitable for use in a circuit capable of delivering the Short-Circuit current for the max mum time duration and voltage marked below. The circuit breaker must include an instantaneous trip response and shall not include a short-time response.

The maximum clearing time of the instantaneous trip response must be equal to or less than the time duration shown for the marked short-circuit current.

Switch Amperes	Short-Circuit Current (RMS Symmetrical Amepres x 1000)	Voltage (VOLTS AC, Maximum)	Time Duration (Sec. Maximum)	Agency
600-800A	50	480	0.050	UL/ IEC/ CSA
600-800A	42	600	0.050	CSA

SHORT-TIME CURRENT RATING

This Transfer Switch does not include Short-Time Current Ratings

FUSE CLASS AND FUSE RATING

SHORT-CIRCUIT RATING WHEN PROTECTED BY FUSE

When protected by a fuse of the specific fuse class and maximum amperage ratings as marked below, this transfer switch is suitable for use in circuits capable of delivering the Short-Circuit current at the maximum voltage marked.

Switch Amperes	Short-Circuit Current (RMS Symmetrical Amepres x 1000)	Voltage (VOLTS AC, Maximum)	Fuse Class	Rating Amperes	Agency
600A	200	480	L, J, RK5, RK1	750A Max.	UL/ IEC/ CSA
600A	150	600	L, J, RK5, RK1	750A Max.	CSA
800A	200	480	L	1200A Max.	UL/ IEC/ CSA

SPECIFIC BREAKER RATING AND LIST OF APPROVED BREAKERS

SHORT-CIRCUIT RATINGS WHEN USING SPECIFIC CIRCUIT BREAKERS

When protected by a circuit breaker of specific manufacturer, type, and ampere rating as marked below, this Transfer Switch is suitable for use in a circuit capable of delivering the Short-Circuit current at the maximum voltage marked below.

	UL/ IEC /CSA 480V. max. Short-Circuit Current (RMS SYMM AMPS X 1000)	CSA 600V. max. Short-Circuit Current (RMS SYMM AMPS x 1000)
With specific manufacturing molded case circuit breakers (MCCB) per table A below	65	
With specific manufacturing molded case circuit breakers (MCCB) per table B below		50

TABLE A

Manufacturer	Max. Amp	Type
Eaton	600A. 800A.	HLD, CHLD, LDC, CLDC HMDL, HMDLB,CHMDL, NB TRI PAC
ITE/Siemens	600A. 800A. 1200A. 1600A.	CLD6, SHLD6, SCLD6, HLD6, HLXD6, HHLD6, HHLXD6 CMD6, HMXD6, HMD6, SCMD6, SHMD6, SCND6, SHND6 HND6, HNXD6, CND6 HRD6, HRXD6
ABB	600A. 1200A.	SGH, SGL, SGP SKL, SKP, SKT, SKS
Schneider	600A. 1200A. 1600A.	LJ, LL, LR PJ MASTERPACT NW

TABLE B

Eaton	600A. 800A.	LDC, CLDC NB TRI PAC, DSL206
Schneider	600A. 800A. 1200A.	LI, LXI NC, NE, NX PK
ITE/Siemens	600A. 800A. 1200A.	CLD6, HHLD6, HHLXD6,SCLD6, SHLD6 CMD6, HMD6, SCMD6, SCND6, SHMD6, SHND6 CND6,SCND6
ABB	600A. 800A. 1200A.	TB6, SGL6, SGP6 TB8, THP, THC, SKP8 SKP

Fig 1 (Label shown for reference only)

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