



## CTSD SERIES – SUPPLEMENT DELAYED TRANSITION TRANSFER SWITCH

### FEATURES

- Ratings 40 to 4000 amps (2, 3 or 4 poles)
- UL 1008 listed at 480 VAC
- NEMA 1, 3R, 4, 4X and 12
- Available to 600 VAC, 50 or 60 Hz
- Suitable for emergency and standby applications on all classes of load, 100% tungsten rated through 400 amps
- UL 1008 listed at 480 VAC
- CSA C22.2 No. 178 certified at 600 VAC
- IEC 947-6-1 listed at 480 VAC

### PERFORMANCE FEATURES

- Adjustable center-off time to meet specific installation requirements
- High close-in and withstand capability
- Temperature rise test per UL 1008 conducted after overload and endurance tests in unventilated enclosure – exceeds UL requirements

### DESIGN AND CONSTRUCTION FEATURES

- Mechanically interlocked center-off position for load decay
- Electrically operated, mechanically held by a simple, over-center mechanism
- Segmented silver tungsten alloy contacts with separate arcing contacts on all sizes

- Arc quenching grids, enclosed arc chambers, and wide contact air gap for superior source-to-source isolation on all units
- Control circuit disconnect plug and drive inhibit switch for safe maintenance
- Components accessible for inspection and maintenance without removal of the switch or the power conductors
- Mechanical indicator and contact chamber cover designed for inspection, safety and position designation

### DELAYED TRANSITION TRANSFER SWITCHES

The CTSD provides an adjustable time delay after the opening of the closed contacts and before the closing of the open contacts for transferring large motor and/or transformer loads. This delayed transition time allows for motors to coast down and transformer fields to decay, thus allowing inductive loads to be re-energized after transfer with only normal inrush starting currents. The delayed transition design is an effective method of handling these applications and can be utilized as an alternative to a standard transfer switch equipped with an in-phase monitor.

The delayed transition transfer switch is ideally suited for pumping stations, sewage treatment plants, hospital X-ray equipment, or wherever the bulk of the load being controlled consists of large motors and/or transformers. Further, many UPS manufacturers strongly recommend the use of delayed transition type transfer switches to ensure proper operation and sequencing of their equipment.

The CTSD Series allows a typical UPS system sufficient delay to recognize a power failure and transfer to batteries, acknowledge the return of input power and allow the rectifier to *walk-on* to the new source, reducing any transfer anomalies. Except for the adjustable delayed transition period, the performance, operating capabilities, ratings, UL listings, withstand current values and available options are identical to those of the CTS Series Automatic Transfer Switches.

The CTSD incorporates all of the important features of the standard CTS Series switch. In addition, its unique design incorporates features oriented toward its specific operation.

## APPLICATION INFORMATION

When transferring large motors, UPS systems and/or transformers between two sources of power that have the potential to be unsynchronized, consideration must be given to the elimination or reduction of transients. These may occur when loads are disconnected from the first power source and immediately connected to the second source.

When a running motor is suddenly disconnected from its power source, the residual voltage developed due to generator action will decrease in amplitude and frequency as the motor slows down. Depending on the type, number, and application of the motors involved, the decaying action may take a considerable amount of time. Similarly when a transformer is disconnected from the line, time is required for its magnetic field to collapse. Release of stored energy in the transformer generates a surge even though the two power sources are in synchronism when a transfer is initiated. The transient caused by the momentary high current flow described above can exceed the instantaneous trip settings of protective devices in the system and can be severe enough to trip circuit breakers and cause damage to motor shafts couplings, etc.

One solution to this problem is to introduce a delay in the transition between two live sources. The CTSD Series Delayed Transition Transfer Switches have been designed expressly for this purpose.

The advantages of using delayed transition when transferring large motor and/or transformer loads are:

- Consistent operation under all conditions, including manual (pushbutton) operation
- Operation is totally independent of the synchronism of the power sources, eliminating the need for in-phase monitors or extensive motor disconnect control wiring between the transfer switch and motor control centers
- The delayed transition function adapts itself for use in multiple generator systems and paralleling systems to permit load shedding by switching the main contacts to a center-off or disconnected position
- Allows typical UPS systems to function properly while switching between line input sources

## DESCRIPTION AND OPERATION

The operation of the CTSD Series Delayed Transition Transfer Switch is identical to the CTS with the exception of the drive mechanism. Upon failure or reduction of the normal source, and the availability of the emergency source, the drive solenoid is energized and pulls the main contacts out of the normal position and locks them mechanically in the open transition position.

An adjustable time delay is then energized. After the preset time has elapsed, the drive solenoid is energized and pulls the main contacts out of the open transition position and locks them mechanically in the emergency closed position. The emergency power source is now feeding the load.

When the voltage sensing detects the restoration of the normal source for a predetermined time period, the drive solenoid is energized and pulls the main contacts from the emergency position and locks them mechanically in the open transition position. After the preset time delay has elapsed, the drive solenoid is energized and pulls the main contacts out of the open transition position and locks them mechanically in the normal closed position. The normal power source is now feeding the load.

All voltage and frequency sensing controls, disconnect plug, test switch, time delays and other accessories supplied on the CTS Series are also supplied on the CTSD Series.

## DIMENSIONAL SPECIFICATIONS

CTSD Series Delayed Transition Transfer Switches							
Ampere Rating	Poles	NEMA 1 Enclosed					Application Notes
		Height (A)	Width (B)	Depth (C)	Reference Figure	Weight	
40, 80, 100, 150, 225, 260 & 400	2,3	46 (1168)	24 (610)	14 (356)	A	200 (91)	1-5
	4	46 (1168)	24 (610)	14 (356)	A	200 (91)	
600	2,3	74 (1880)	40 (1016)	20 (508)	B	400 (181)	1-6
	4	74 (1880)	40 (1016)	20 (508)	B	450 (204)	
800, 1000, & 1200	2,3	74 (1880)	40 (1016)	20 (508)	B	475 (215)	1-6
	4	74 (1880)	40 (1016)	20 (508)	B	560 (254)	
1600 & 2000	3	90 (2286)	36 (914)	48 (1219)	C	1030 (467)	1-7
	4	90 (2286)	36 (914)	48 (1219)	C	1150 (522)	
3000	3	90 (2286)	36 (914)	48 (1219)	C	1190 (540)	1-7
	4	90 (2286)	36 (914)	48 (1219)	C	1415 (642)	
4000	3	90 (2286)	47 (1194)	62 (1575)	C	1615 (732)	1-7
	4	90 (2286)	47 (1194)	62 (1575)	C	1870 (848)	

### Application Notes :

1. Dimensions are listed in inches (mm) and weights in pounds (kg).
2. Includes 1.25" door projection beyond base depth. Allow a minimum of 3" additional depth for projection of handle, light switches, pushbuttons, etc.
3. **All dimensions and weights are approximate and subject to change without notice and are not for construction use.**
4. Special enclosures (NEMA 3R, 4, 12, etc.) may include mounting tabs, etc. Consult the published dimension drawings for details
5. Packing materials must be added to weights shown. Allow 15% additional weight for cartons, skids, crates, etc.
6. Add 4" in height for removable lifting lugs.
7. Ventilation louvers on side/rear of enclosure at 3000 and 4000A. One side or rear must be clear to afford proper airflow

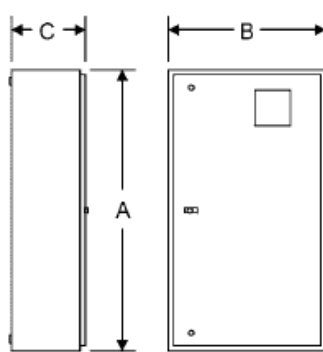


Figure A

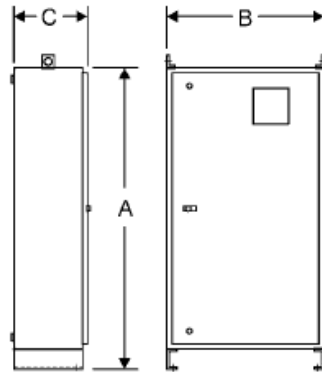


Figure B

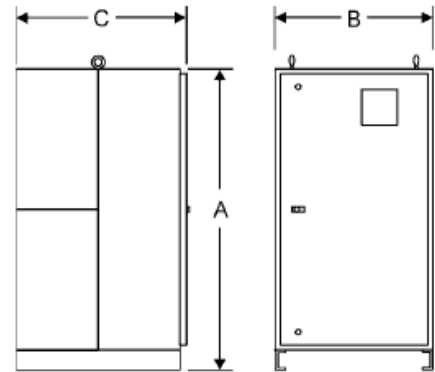


Figure C

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