

CTSCT SERIES – SUPPLEMENT CLOSED TRANSITION TRANSFER SWITCH

FEATURES

ELECTRICAL RATINGS

- Ratings 100 to 4000 amperes
- 2, 3 or 4 Poles
- NEMA 1, 3R, 4, 4X and 12
- Available in Transfer Switch (CTSCT) or Transfer/Bypass Switch (CBTSCT) styles
- Suitable for emergency and standby applications on all classes of load, 100% tungsten rated through 400 amps
- UL 1008 listed at 480 VAC
- CSA certified at 600 VAC
- IEC listed at 480 VAC

PERFORMANCE FEATURES

- Incorporates the applicable features of the CTS and CBTS Series
- Source parallel time of less than 100 milliseconds
- Closed transition operation (no power interruption) during transfer and retransfer when both sources are available and within specified parameters
- Open transition transfer operation is initiated upon a source failure

DESIGN AND CONSTRUCTION FEATURES

- Electrically operated, mechanically held
- Segmented silver tungsten alloy contacts with separate arcing contacts on all sizes
- Arc quenching grids, enclosed arc chambers, and wide contact air gap
- Components accessible for inspection and maintenance without removal of the switch or the power conductors
- Standard annunciation and operational selection package for user interface
- Active control of the generator governor not required, but is available as an option

CLOSED TRANSITION SWITCHES

An automatic transfer switch is the single vital link between utility and alternate power supplies. Yet it is the very operation and testing of this device that may be the cause of concern for many users. Loads such as electronic equipment, UPS systems, HID lighting, motor starters, etc., are sensitive to even the 30-100 millisecond outage experienced during a typical transfer switch operation. Therefore, testing and use of the standby system is not optimized and necessary system checks are not performed because of concerns about the effects of transfer.

In addition to these applications, opportunities for peak shaving and utility incentive rates may be passed over because of the inability to accept the short power interruptions inflicted during operation. In response to the needs of these installations, Caterpillar offers the CTSC Closed Transition Switch and CBTSCT Closed Transition Transfer/Bypass Switch.

These products utilize the proven switching technology of the CTS/CTSD Series of transfer switches combined with controls developed during Caterpillar's years of experience in the manufacture of synchronizing switchgear.

They provide the capability to transfer in a closed transition mode when both sources are within preset parameters. Utilizing a high speed drive system, the overlap of the normal and alternate sources is less than 100 milliseconds. When one source is not within specified limits, such as during a power failure, the CTSC operates in an open transition mode.

DESCRIPTION AND OPERATION

Closed transition switches have two basic modes of operation. During a failure of one source or an out of specification condition, the CTSC Series operates as a standard delayed transition switch (CTSD Series). This sequence allows clear separation of an unreliable source from an available one.

Closed transition operation takes place when both sources are within preset voltage and frequency parameters and the phase angle differential is less than five degrees. The closed transition sequence may be initiated by the test switch, a load exerciser clock, peak shaving controls or special utility incentive rate signals.

When a transfer signal is received from one of the above mentioned methods, the engine generator set is started and allowed to reach rated voltage and frequency. The control system compares the phase angle of the two power sources and when the proper relationship is reached, the emergency drive solenoid is energized and the emergency main contacts are closed and locked mechanically.

The normal drive solenoid is then energized, the utility main contacts are opened and mechanically locked in this position.

The overlap time of the two sources is less than 100 ms. Retransfer from a generator set to the utility source is also performed in the closed transition mode. If, however, a generator failure occurs, the unit will revert to standard delayed transition operation.

The CTSC and CBTSCT switches include the same level of standard features as the CTS Series and add an Annunciation and Selector Switch Package containing:

- Sources in Synchronism (lamp)
- Failure to Synchronize (lamp)
- Normal Failure to Open (lamp)
- Emergency Failure to Open (lamp)
- Shunt Trip Activated (lamp)
- Open/Closed Transition Selector Switch (key operated)
- Automatic/Test Operation Switch
- Lockout Reset (key operated)
- Shunt Trip Reset (key operated)
- Annunciator Horn with silence button and lamp

APPLICATION INFORMATION

- Closed transition switches require a momentary (less than 100 ms) paralleling of the standby source with the utility. This usually requires the owner to obtain approval of the installation by the utility.
- The purpose of a closed transition switch is to prevent the momentary outages that occur during transfer of a standard unit. This technology is not a substitute for a UPS system as it does not provide stored energy capability but rather acts in a complementary fashion.
- System application requirements:
The generator set must be provided with an isochronous governor stable at a frequency differential of not more than $\pm .25\%$ from 60 Hz. A 24 VDC shunt trip circuit is strongly suggested on one of the feeder breakers, normally the generator feeder. Power for this trip circuit and alarm system backup must be supplied from the engine starting batteries or an equivalent source.

- Soft Load:
When conditions are most sensitive to generator voltage drop or frequency dips, Caterpillar can provide a variation of the closed transition method of transfer which further combines the attributes of a CTSCCT with generator paralleling switchgear. By employing automatic synchronizing, active loading controls and a greater interconnect (parallel) time, a soft-loaded/closed transition transfer can be accomplished.

Note that this method of transfer interconnects the utility and generator sources for a longer period (seconds rather than cycles), and greater coordination with the local utility company is necessary. Typically, more sophisticated protective relaying schemes will be required. Therefore we suggest that prior to specifying option SL on your CTSCCT (SL) or CBTSCT (SL) unit, you consult with your Caterpillar dealer for further input.

CTS SERIES DIMENSIONAL SPECIFICATIONS

CTSCT Series Closed Transition Switches								
Ampere Rating	Poles	NEMA 1 Enclosed				Reference Figure	Weight	Application Notes
		Height (A)	Width (B)	Depth (C)				
100,150, 225, 260 & 400	2,3	66 (1676)	24 (610)	20 (508)	A	220 (100)	1-6	
	4	66 (1676)	24 (610)	20 (508)	A	241 (109)		
600	2,3	74 (1880)	40 (1016)	20 (508)	A	400 (181)	1-6	
	4	74 (1880)	40 (1016)	20 (508)	A	450 (204)		
800 & 1000	2,3	74 (1880)	40 (1016)	20 (508)	A	475 (215)	1-6	
	4	74 (1880)	40 (1016)	20 (508)	A	560 (254)		
1200	2,3	74 (1880)	40 (1016)	20 (508)	A	475 (215)	1-6	
	4	74 (1880)	40 (1016)	20 (508)	A	560 (254)		
1600 & 2000	3	90 (2286)	36 (914)	48 (1219)	B	1030 (467)	1-6	
	4	90 (2286)	36 (914)	48 (1219)	B	1190 (540)		
3000	3	90 (2286)	36 (914)	48 (1219)	B	1150 (522)	1-7	
	4	90 (2286)	36 (914)	48 (1219)	B	1415 (642)		
4000	3	90 (2286)	47 (1194)	60 (1524)	B	1635 (742)	1-7	
	4	90 (2286)	47 (1194)	60 (1524)	B	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

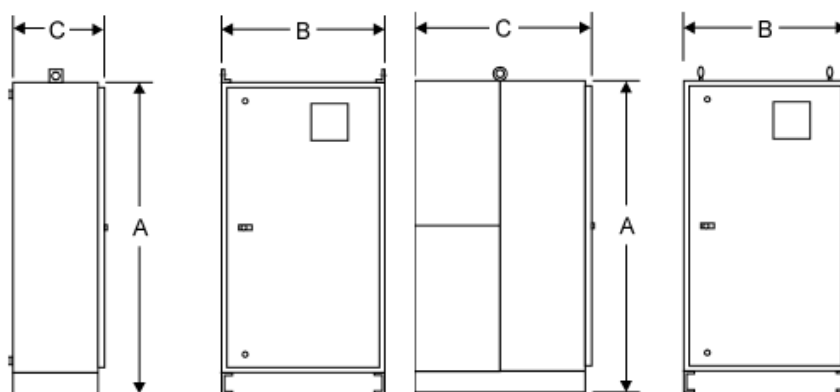


Figure A

Figure B

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