



CBTS SERIES – SUPPLEMENT OPEN TRANSITION BYPASS SWITCH

FEATURES

ELECTRICAL RATINGS

- Ratings 100 to 4000 amperes
- 2, 3 or 4 Poles
- NEMA 1, 3R, 4, 4X and 12
- Available with CTS, CTSD and CTSCT Series Transfer Switch
- Bypass and transfer switch have identical ratings 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

- Load is not interrupted during bypass operation
- 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

- Transfer switch is located on a draw out mechanism to facilitate maintenance
- Emergency power systems can be electrically tested without disturbing the load
- Power cables do not have to be disconnected to remove transfer switch

- Bypass to any available source with transfer switch removed
- Engine start circuit maintained during bypass operation; normal power failure causes engine start contact closure even with the ATS removed
- Diagnostic lights and detailed instructions for simple step by step operation
- Mechanical and electrical interlocks ensure proper sequence of operation
- Bypass switch contacts are closed only during the bypass-isolation operation
- Silverplated copper bus interconnection of the transfer and bypass switches on all sizes

Transfer/Bypass-Isolation Switches

The automatic transfer switch is a key element in any emergency power system. The importance of the transfer switch increases as the need for dependable power grows. Though designed to give consistent operation, the automatic transfer switch must be periodically maintained to ensure proper operation and system reliability. Maintenance of the entire system is called for in the National Electrical Code Article 700-4, NEMA Standard ICS2-447 and in NFPA 99.

In some non-critical emergency power systems, it is possible to disconnect the power feeders from the automatic transfer switch and electrically isolate the switch for servicing. Yet, there are many critical systems where interruption of power is not permissible. In hospital communication systems, data processing centers, airports, etc., power disruption is not permitted. For these systems, the use of a bypass-isolation switch with the transfer switch is essential and often required by code. To meet these requirements for the inspection and/or maintenance of the transfer switch without power interruption, Caterpillar offers the CBTS Series Bypass-Isolation Transfer Switch.

Description and Operation

The CBTS Series Bypass-Isolation Transfer Switch consists of two major modules – the automatic transfer and the bypass-isolation switch. The automatic transfer switch module is the proven CTS Series, built in CTS, CTSD or CTSC configuration and constructed for rugged, reliable operation. The same components – heavy-duty silver alloy contacts, rugged drive mechanism and silver plated bus bar interconnections are used throughout the CBTS Series.

The bypass section is a basic CTS switch provided with a quick make/quick break manual load transfer handle and a control/interlock system consisting of both mechanical and electrical interlocks. The bypass is equipped with normal failure sensing and a time delay to start the engine automatically if the ATS has been removed for service and a failure occurs. The modules are mounted in a compact enclosure and completely interconnected requiring only the normal source, emergency source and load cable connections. Once installed, no cables need to be removed to isolate the transfer switch module for maintenance or inspection. The automatic transfer switch may be withdrawn for testing or maintenance without disturbing the load.

The transfer switch module has three positions:

1. Automatic: The transfer switch is carrying the load, and the bypass switch is in the open position. This is the normal operating position.

2. Test: The bypass switch is closed and feeding the load. The transfer switch has control power and may be operated for test purposes via the test switch on the enclosure door.
3. Isolate: The transfer switch is withdrawn from all power and ready for maintenance. The load is served by the bypass switch.

The CTS Transfer Switch is installed on a draw-out mechanism, with electrical and mechanical interlocks for secure removal after load bypass. The CTS control/logic panel is mounted on the enclosure door and connected by a wire harness and multi-pin disconnect plugs. The transfer switch and/or the control panel may be tested, isolated and removed for maintenance without load interruption.

The bypass-isolation switch module is the same basic design as the transfer switch module and thus has the same electrical ratings. Manually operated, it features high speed, quick make/quick break contact action. The bypass-isolation switch has three basic positions:

1. Automatic: Normal bypass contacts open, emergency bypass contacts open.
2. Bypass Normal: Normal bypass contacts closed, emergency bypass contacts open.
3. Bypass Emergency: Normal bypass contacts open, emergency bypass contacts closed.

The CBTS's design requires no additional load break contacts which cause load interruption during bypass-isolation functions. The bypass isolation switch contacts are out of the system current path except during actual bypass operation. Therefore, they are not constantly exposed to the destructive effects of potential fault currents. The normal, emergency and load are connected between the automatic transfer switch and the bypass-isolation switch through solidly braced isolating contacts that are open when the transfer switch is isolated. All current carrying components provide high withstand current ratings in excess of those specified in UL 1008 standards.

Interlocks and Indicators

Every CBTS Series Bypass-Isolation Transfer Switch is supplied with all necessary electrical and mechanical interlocks to prevent improper sequence of operation as well as the necessary interlocking circuit for engine starting integrity.

Each CBTS is furnished with a detailed step by step operating instruction plate as well as the following function diagnostic lights:

- Normal Source Available
- Emergency Source Available
- Bypass Switch in Normal Position
- Bypass Switch in Emergency Position
- Automatic Transfer Switch in Test Position
- Automatic Transfer Switch Isolated
- Automatic Transfer Switch Inhibit
- Automatic Transfer Switch Operator Disconnect Switch "Off"
- Automatic Transfer Switch in Normal Position
- Automatic Transfer Switch in Emergency Position

CBTSD Series – Delayed Transition Transfer/Bypass-Isolation Switches

The CTSD Delayed Transition Transfer Switch with a timed center-off position is available in a bypass configuration. The CBTSD Series Bypass incorporates the features of both the CBTS Bypass-Isolation Switch and the CTSD unit for transfer of large motor loads, transformers, UPS systems or load shedding to a neutral "Off" position. Reference the CTSD unit features and operation discussion for more details.

CBTSCT Series – Closed Transition Transfer/Bypass-Isolation Switches

The CTSCCT Closed Transition Transfer Switch may be applied with a bypass-isolation switch for the utmost in reliability and versatility. The CBTSCT Series provides the ability to withdraw the transfer switch unit for maintenance or inspection. Reference the CTSCCT unit features and operation discussion for more details.

DIMENSIONAL SPECIFICATIONS

CBTS, CBTSD Series Transfer/Bypass Isolation Switches							
Ampere Rating	Poles	NEMA 1 Enclosed					Application Notes
		Height (A)	Width (B)	Depth (C)	Reference Figure	Weight	
100, 150, 225, 260 & 400	2,3	83 (2108)	30 (762)	25.25 (641)	D	770 (350)	1-6
	4	83 (2108)	30 (762)	25.25 (641)	D	840 (381)	
600	3	90 (2286)	36 (914)	28.25 (718)	E	1220 (553)	1-8
	4	90 (2286)	40 (1016)	28.25 (718)	E	1365 (619)	
800, 1000 & 1200	3	90 (2286)	40 (1016)	28.25 (718)	E	1355 (615)	1-8
	4	90 (2286)	46 (1168)	28.25 (718)	E	1570 (712)	
1600	3	80 (2032)	40 (1016)	164 (4166)	E	4044 (1835)	1-5 & 9
	4	80 (2032)	46 (1168)	164 (4166)	E	4431 (2010)	
2000	3	80 (2032)	40 (1016)	164 (4166)	E	4044 (1835)	1-5 & 9
	4	80 (2032)	46 (1168)	164 (4166)	E	4431 (2010)	
3000	3	80 (2032)	40 (1016)	164 (4166)	E	4456 (2021)	1-5 & 9
	4	80 (2032)	46 (1168)	164 (4166)	E	4977 (2258)	
4000	3	90 (2286)	47.5 (1207)	80 (2032)	F	4660 (2113)	1-5 & 9
	4	90 (2286)	54 (1372)	80 (2032)	F	5860 (2658)	

APPLICATION NOTES:

- Dimensions are listed in inches (mm) and weights in pounds (kg).
- Includes 1.25" door projection beyond base depth. Allow a minimum of 3" additional depth for projection of handle, light, switches, pushbuttons, etc.
- All dimensions and weights are approximate and subject to change without notice and are not for construction use.**
- Special enclosures (NEMA 3R, 4, 12, etc.) may include mounting tabs, etc. Consult the published dimensional drawings for details.
- Packing materials must be added to weights shown. Allow 15% additional weight for cartons, skids, crates, etc.
- Add 4" in height for removable lifting lugs.
- CBTS/CBTSD 600-1200 amp shipped horizontally (on rear of unit).
- CBTS 600-1200 standard configuration is top entry. Rear adapter bay (wireway) required for bottom entry.
- Bypass switch weights for 1600-4000 amp units vary up to 10% based on connection configurations. Weights shown are for estimation only. Ventilation louvers on 3000 and 4000A units require one side or rear of enclosure to be clear in order to afford proper airflow

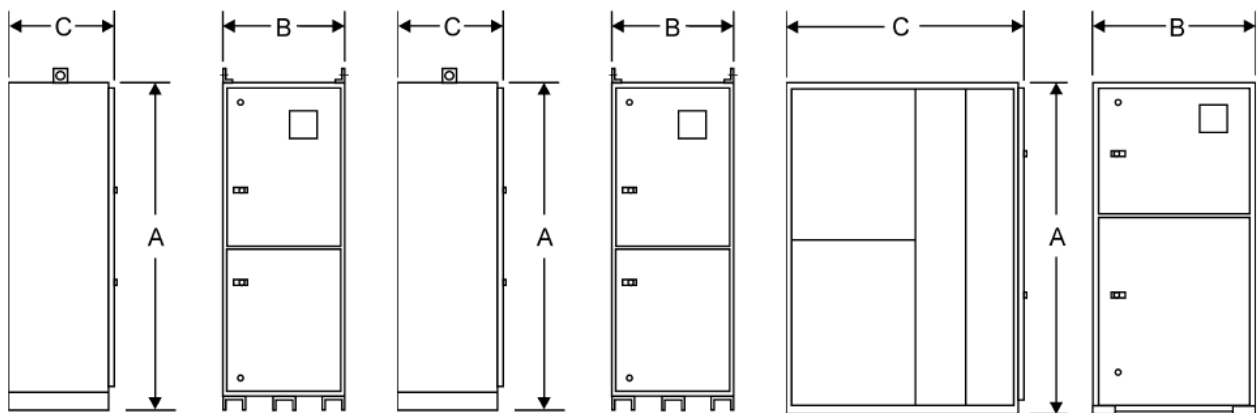


Figure D

Figure E

Figure F

DIMENSIONAL SPECIFICATIONS

CBTSCT Series Closed Transition Transfer/Bypass-Isolation Switches							
Ampere Rating	Poles	NEMA 1 Enclosed					Application Notes
		Height (A)	Width (B)	Depth (C)	Reference Figure	Weight	
100, 150, 225, 260 & 400	2,3	90 (2286)	36 (914)	28.25 (718)	D	1280 (581)	1-6
	4	90 (2286)	40 (1016)	28.25 (718)	D	1385 (628)	
600	3	90 (2286)	36 (914)	28.25 (718)	E	1280 (581)	1-8
	4	90 (2286)	40 (1016)	28.25 (718)	E	1385 (628)	
800, 1000 & 1200	3	90 (2286)	40 (1016)	28.25 (718)	E	1435 (651)	1-8
	4	90 (2286)	46 (1168)	28.25 (718)	E	1640 (744)	
1600 & 2000	3	80 (2032)	40.5 (1029)	64.5 (1638)	F	4044 (1835)	1-5 & 9
	4	80 (2032)	46 (1168)	64.5 (1638)	F	4431 (2010)	
3000	3	80 (2032)	40.5 (1029)	64.5 (1638)	F	4456 (2021)	1-5 & 9
	4	80 (2032)	46 (1168)	64.5 (1638)	F	4977 (2258)	
4000	3	90 (2286)	47.5 (1207)	81 (2057)	F	4730 (2145)	1-5 & 9
	4	90 (2286)	54 (1372)	81 (2057)	F	5930 (2689)	

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 dimensional 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. CBTS/CBTSD 600-1200 amp shipped horizontally (on rear of unit).
8. CBTS 600-1200 standard configuration is top entry. Rear adapter bay (wireway) required for bottom entry.
9. Bypass switch weights for 1600-4000 amp units vary up to 10% based on connection configurations. Weights shown are for estimation only. Ventilation louvers on units 3000 to 4000A require one side or rear of enclosure to be clear in order to afford proper airflow.

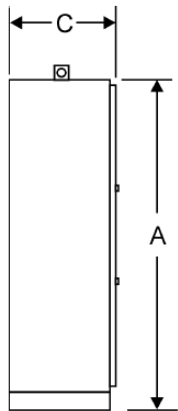


Figure D

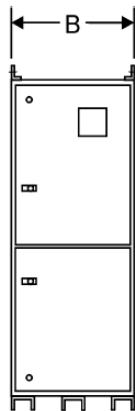


Figure E

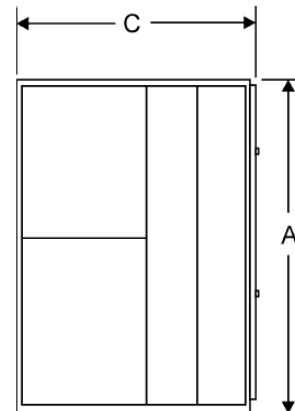
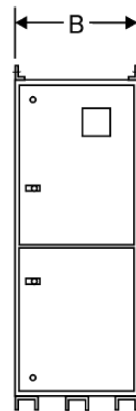
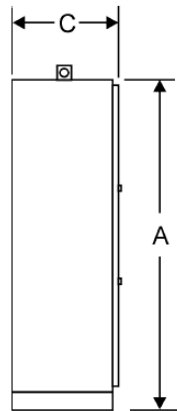
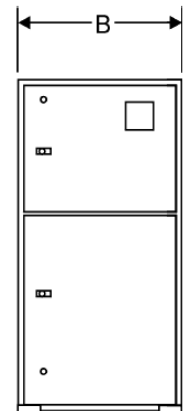


Figure F



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