
Zenith ZBTS/ ZBTSD/ZBTSCT

Transfer/Bypass-Isolation Transfer Switches

Introduction

ABB's Zenith ZBTS Series Bypass Isolation Transfer Switch consists of two major modules – the automatic transfer and the bypass-isolation switches. The automatic transfer switch module is ABB's proven Zenith ZTS Series, built in ZTS, ZTSD or ZTSCT configuration and constructed for rugged, reliable operation. The same components – heavy-duty silver alloy contacts, rugged drive mechanism and silver plated bus bar inter-connections are used throughout the ZBTS Series.

Features and Benefits

ABB'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 Source 1 (normal), Source 2 (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 automatic transfer switch is isolated. All current carrying components provide high withstand current ratings in excess of those specified in UL 1008 standards.

Design and Construction Features

- Automatic 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 the transfer switch
- Bypass to any available source with the automatic 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



Advantages

- 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 exceeds UL requirements
- Available in ZBTS (utility-generator), ZBTSU (utility-utility), ZBTSG (generator-generator) and ZBTSM (manual) configurations; models include standard, delayed and closed transition

Description and Operation

The bypass section is a ZTS switch provided with a quick make/quick break manual load transfer handle and ABB's control/interlock system consisting of both mechanical and electrical interlocks. The bypass switch is equipped with normal failure sensing and a time delay to start the engine automatically if the ATS has been removed for service. The modules are mounted in a compact enclosure and completely interconnected requiring only Source 1 (normal), Source 2 (emergency) 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/Connected: 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. The load is not affected during testing.
3. Isolate: The transfer switch is withdrawn from all power and ready for maintenance. The load is served by the bypass switch.

The Automatic Transfer Switch is installed on a draw-out mechanism, with electrical and mechanical interlocks for secure removal after load bypass. The ATS 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 automatic 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: Source 1 (Normal) bypass contacts open, Source 2 (emergency) bypass contacts open.
2. Bypass Normal: Source 1 (Normal) bypass contacts closed, Source 2 (emergency) bypass contacts open.
3. Bypass Emergency: Source 1 (Normal) bypass contacts open, Source 2 (emergency) bypass contacts closed.

Interlocks and Indicators

Every ZBTS 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 ZBTS Series Switch is furnished with a detailed, step-by-step operating instruction plate, as well as the following function diagnostic lights:

- Source 1 (Normal) Available
- Source 2 (Emergency) Available
- Bypass Switch in Source 1 (Normal) Position
- Bypass Switch in Source 2 (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 Source 1 (Normal) Position
- Automatic Transfer Switch in Source 2 (Emergency) Position

Electrical Ratings

- Ratings 100 to 4000 amperes
- 2, 3 or 4 Poles
- Open type, NEMA 1, 3R, 4, 4X and 12
- Available with Zenith ZTS, ZTSD and ZTSCT Series Automatic 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

UL 1008 Withstand and Closing Ratings

- Please refer to ABB Publication TB-1102

Specifications

ZBTS & ZBTSD

Ampere Rating	Poles	Nema 1 Enclosed			Reference Figure	Weight		Application Notes
		Height (A)	Width (B)	Depth (C)		Open Type	Nema 1	
100, 150, 225, 260, 400	2, 3	83 (211)	30 (76)	28.5 (72.4)	A	310 (141)	770 (350)	1-9
	4	83 (211)	30 (76)	28.5 (72.4)		380 (173)	840 (322)	
600	3	90 (229)	36 (91)	28.25 (72)	B	660 (299)	1220 (533)	
	4	90 (229)	40 (102)	28.25 (72)		770 (349)	1365 (619)	
800, 1000 1200	3	90 (229)	40 (102)	28.25 (72)	B	765 (347)	1355 (615)	
	4	90 (229)	46 (117)	28.25 (72)		910 (413)	1570 (712)	
1600, 200 2600	3	80 (202)	40.6 (103)	64.6 (164)	C	1978 (897)	4044 (1835)	1-7, 10
	4	80 (202)	46.1 (117)	64.6 (164)		2275 (1032)	4431 (2010)	
3000	3	80 (202)	40.6 (103)	64.6 (164)	C	2572 (1166)	4456 (2021)	1-7, 10-12
	4	80 (202)	46.1 (117)	64.6 (164)		3049 (1383)	4977 (2258)	
4000	3	90 (229)	47.5 (121)	81 (206)	D	4310 (1955)	4660 (2113)	1-7, 10-11
	4	90 (229)	54 (137)	81 (206)		5510 (2499)	5860 (2658)	

Specifications (Cont.)

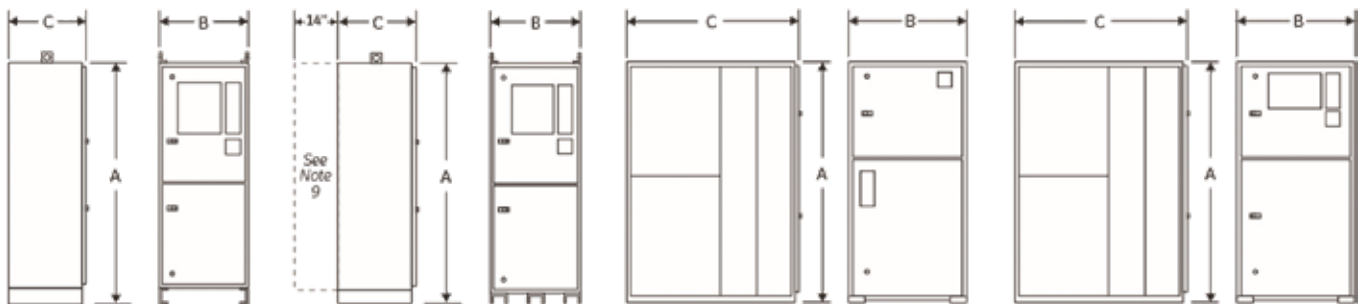
ZBTSCT

Ampere Rating	Poles	Nema 1 Enclosed			Reference Figure	Weight		Application Notes	
		Height (A)	Width (B)	Depth (C)		Open Type	Nema 1		
100, 150, 225, 260, 400, 600	3	90 (229)	36 (91)	28.25 (72)	B	730 (331)	1280 (581)	1-8	
	4	90 (229)	40 (102)	28.25 (72)		840 (381)	1385 (628)		
800, 1000 1200	3	90 (229)	40 (102)	28.25 (72)		C	835 (379)	1435 (651)	1-9
	4	90 (229)	46 (117)	28.25 (72)			980 (444)	1640 (744)	
1600, 200 2600	3	80 (202)	40.6 (103)	64.6 (164)	D		1978 (897)	4044 (1835)	1-7, 10
	4	80 (202)	46.1 (117)	64.6 (164)			2275 (1032)	4431 (2010)	
3000	3	80 (202)	40.6 (103)	64.6 (164)		D	2572 (1166)	4456 (2021)	
	4	80 (202)	46.1 (117)	64.6 (164)			3049 (1383)	4977 (2258)	
4000	3	90 (229)	47.5 (121)	81 (206)	D		4380 (1986)	4730 (2145)	1-7,
	4	90 (229)	54 (137)	81 (206)			5580 (2531)	5930 (2689)	

Application Notes

1. Metric dimensions (cm) and weights (Kg) shown in parenthesis adjacent to English measurements in inches and pounds.
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.
4. Special enclosures (NEMA 3R, 4, 4X, 12, etc.) dimensions and layout may differ. Consult the ABB factory for details.
5. Bypass Model product can not be ordered with inverted style.
6. Special lug arrangements may require different enclosure dimensions. For certified drawings, contact the ABB factory.
7. Packing materials must be added to weights shown. Allow 15% additional weight for cartons, skids, crates, etc.
8. Add 4" in height for removable lifting lugs.
9. ZBTS(D) 600-1200A & ZBTSCT 100-1200A standard configuration is top entry. 14" rear adapter bay required for bottom entry. Consult the ABB factory for details.
10. Bypass switch weights for 1600 - 4000 amp units vary up to 10% based on connections variations. Weights shown are for estimation only.
11. 3000 amp depth dimension shown is standard. Depending on your cable/conduit requirements you may desire a deeper enclosure. Consult the ABB factory for further details.
12. Lug adapters for 3000-4000 amp limits may be staggered length for ease of entrance. Consult the ABB factory for details.

Reference Figure



ZBTS & ZBTSD: AL-CU UL Listed Solderless Screw-Type Terminals for External Power Connections

Switch Size Amps	Normal, Emergency & Load Terminals	
	Cables/ Pole	Wire Ranges
100–225	1	#6 to 250 MCM
260		
400	2	#4 to 600 MCM
600	4	#4 to 600 MCM
800 / 1000 / 1200	*	*
1600 / 2000 / 2600 / 3000 / 4000	*	*

ZBTST: AL-CU UL Listed Solderless Screw-Type Terminals for External Power Connections

Switch Size Amps	Normal, Emergency & Load Terminals	
	Cables/ Pole	Wire Ranges
100–400	1	#4 to 600 MCM
600	2	#2 to 600 MCM
800 / 1000 / 1200	4	#2 to 600 MCM
1600 / 2000 / 2600 / 3000 / 4000	*	*

* Line and load terminals are located in rear and arranged for bus bar connection.

* Terminal lugs are available at additional cost. Contact the ABB factory for more details.

ZBTSD Model – Delayed Transition Transfer/Bypass-Isolation Switches

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

ZBTST Model – Closed Transition Transfer/Bypass-Isolation Switches

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

On-Site & Emergency Services

- 24/7 Emergency Hotline Spare Parts
- Spare Part Kits
- Product Replacement / Return
- Equipment Rentals
- Battery & Capacitor Replacements Contractual Services
- Maintenance Service Contracts Remote Monitoring & Diagnostics
- Technical Services Training
- Training for Operators Training for Maintenance Staff
- Product Training
- Web-Based Training

Training

ABB offers on-site and classroom training options based on certification curriculum. Technical training can be tailored to individual customer needs. Training enables customers and partners to more effectively manage and support the power infrastructure. We have built our training program on practical learning objectives that are relevant to specific technologies or infrastructure design objectives.

Service & Support

ABB field service and support personnel are trusted advisors to our customers – always available to answer questions and help with any project, large or small. Our certified professional services team consists of experts in every aspect of power conversion with the resources and experience to handle large turnkey projects along with custom approaches to complex challenges. Proven systems engineering and installation best practices are designed to safely deliver results that exceed our customers' expectations.

Warranty

ABB is committed to providing quality products and solutions. We have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired or replaced as soon as possible.



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