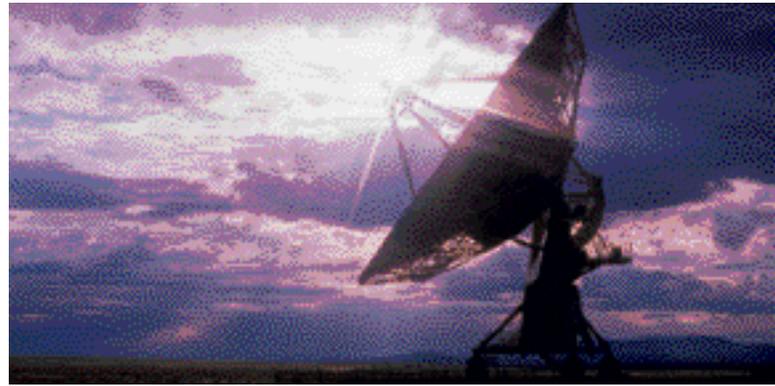
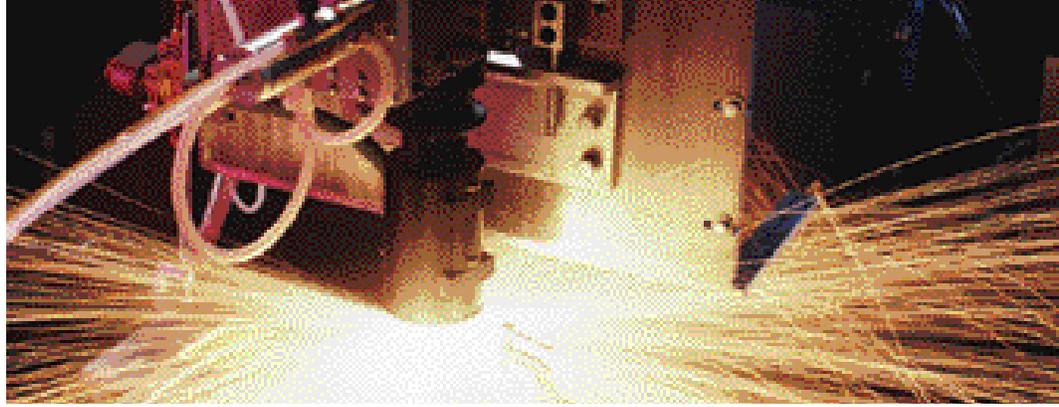
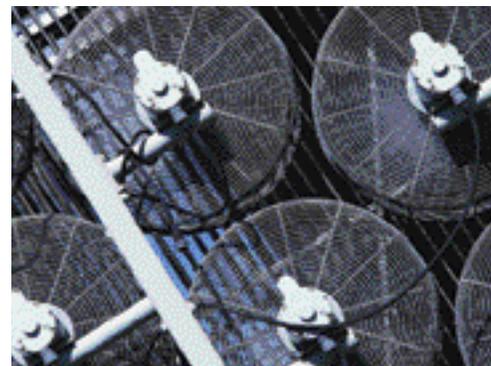


ZTS

Series Transfer Switches



GE Zenith Controls



Quality-Assurance from Start to Shipment

Since 1923, GE Zenith has designed products with customer satisfaction in mind – commencing with an ISO 9001 Registered Quality System and Six Sigma based quality process right on through to an outstanding product development and testing program.

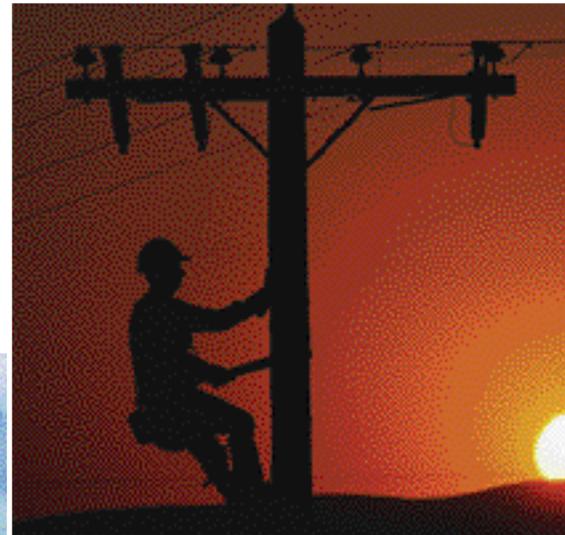
The reliability of GE Zenith's emergency power and electrical control equipment is demonstrated every day in hundreds of thousands of installations around the world.

GE Zenith's ZTS Transfer Switches are supported by the most comprehensive warranty in the business. Our exclusive "2-5-10" warranty covers two years on workmanship, five years on parts, and ten years on the main switch contacts.



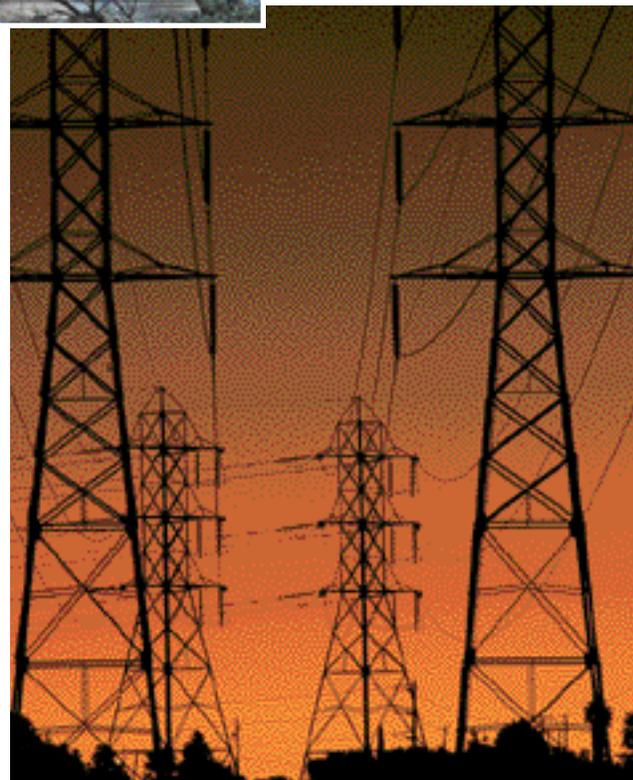
ZBTSL120FC

Transfer/Bypass-Isolation Transfer Switch
1200 amp, 4 pole



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An Introduction to the ZTS Series of Automatic Transfer Switches

The GE Zenith ZTS Series of transfer switches has become a hallmark of quality and performance since its introduction. The reliability that results from superior design and heavy duty construction has made the ZTS a standard in the industry for critical installations. Our emphasis on research and development, design improvements, materials, manufacturing methods, quality assurance, and service yields products that have been proven in hundreds of thousands of installations.

Since the first ZTS units were installed, our engineering staff has been dedicated to the constant improvement and expansion of our line. Today, GE Zenith offers the widest selection of transfer switch products worldwide.

- ZTS Automatic Transfer Switches
- ZTSD Delayed Transition Transfer Switches
- ZTSM Manual Transfer Switches
- ZTSCT Closed Transition Transfer Switches
- ZBTS Automatic Transfer/Bypass Switches
- ZBTSD Delayed Transition Bypass Switches
- ZBTSCT Closed Transition Bypass Switches
- ZTS-MVB Medium Voltage Transfer Switches 5 kV
- ZTS-MVD Medium Voltage Transfer Switches 5-15 kV
- ZTG Automatic Transfer Switches
- ZTGD Delayed Transition Transfer Switches
- ZTX Automatic Transfer Switches
- LVSTS Static Transfer Switches (to 600 V)

All ZTS products meet or exceed industry requirements to allow specification and installation with confidence.

- UL 1008 listed through 480 VAC
- CSA C22.2 No. 178 listed through 600 VAC
- IEC 947-6-1 listed through 480 VAC
- Codes and Standards
 - ✓ NFPA 70, 99, 101, 110
 - ✓ IEEE 446, 241
 - ✓ NEC 517, 700, 701, 702
 - ✓ NEMA ICS2-447
- Controls tested in accordance with:
 - ✓ IEEE 472 (ANSI C37.90A)
 - ✓ EN55022 Class B (CISPR 11) (Exceeds EN55011 & MILSTD 461 Class 3)
 - ✓ EN61000-4-2 (Level 4)
 - ✓ EN61000-4-3 (ENV50140) 10 v/m
 - ✓ EN61000-4-4
 - ✓ EN61000-4-5, IEEE C62.41 (1.2 X 50ms, 5 & 8 kV)
 - ✓ EN61000-4-6 (ENV50141)
 - ✓ EN61000-4-11

- Enclosures meet the requirements of:
 - ✓ UL 508, 50
 - ✓ ANSI C33.76
 - ✓ ICS 6
 - ✓ NEMA 250
- Quality System:
 - ✓ ISO 9001 Registered



All team members at GE Zenith are aware of the critical situations in which our products are called upon to perform. With that understanding comes an obligation beyond merely fulfilling an order or designing a product. Serving that obligation is our mission at GE Zenith Controls.

GE Zenith's team works with you from the first phone call through completed start-up. Then, working hand in hand with your consulting engineer, the contractor and the facility owner, we'll ensure that the system fulfills both current and future needs.

"Commitment to our Customers" has been GE Zenith's driving force for more than 75 years in the power control industry. This same sense of purpose and responsibility will continue as we address future power control challenges.

Extensive Customer Service and Support

Supported by a worldwide network of factory-trained Authorized Service Centers, our Technical Service Representatives can provide you with field service, equipment parts and preventive maintenance.

In addition, GE Zenith offers complete training programs for on-site personnel who may be called upon to make decisions regarding the operation of the system. Because emergency power systems are required to operate under the most adverse circumstances, the future of the installation depends on personnel who are equipped to make the right decisions.

GE Zenith offers a variety of training options including:

- On-site classes for project personnel
- Factory instruction on your equipment prior to shipment
- Service schools covering transfer switches and switchgear systems

Representative installations of GE Zenith automatic transfer switches and power generation switchgear systems covering all industries, applications and sizes... worldwide.

Aviation



Entertainment



Healthcare



Security



Commercial



Financial



High Technology



Telecommunications



Education



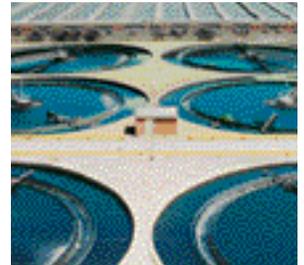
Government



Industrial



Utility





LVSTS
Static Transfer Switch



ZTG
Automatic Transfer Switch



ZTS-MVD
Automatic Transfer Switch



ZTX
Automatic Transfer Switch



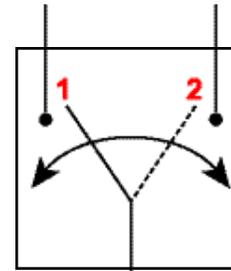
Entelli-Sys Express
Paralleling Switchgear



GE Zenith Controls

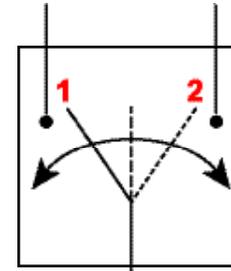
An Automatic Transfer Switch (ATS) is the critical link in an electrical system that allows the selection of an alternate power supply during a service outage or planned transfer. As the central tie point for the distribution of reliable power, the equipment is responsible for maintaining hospital critical care loads, financial and data networks, telecommunications, public health and safety systems, and an almost unlimited number of other vital services.

In its simplest form, an automatic transfer switch monitors a utility source that flows through the switch feeding important down-line loads. When the utility experiences an out-of-specification condition, normally a source failure, the ATS will send a start signal to a standby engine generator set, monitor the startup of that emergency source and when it is capable of generating satisfactory power, the ATS transfers the load to the standby source. The automatic transfer switch then monitors for the return of the normal (utility) source and after making certain that the utility feed has been reliably established, re-transfers the load to the utility, runs the gen-set on a cool down cycle and shuts it down to await the next power failure. All of this action is fully automatic, requiring no involvement of site personnel.



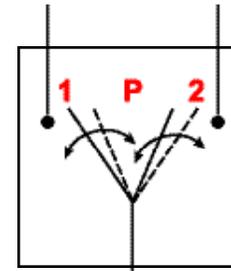
LOAD

ZTS Standard Transition



LOAD

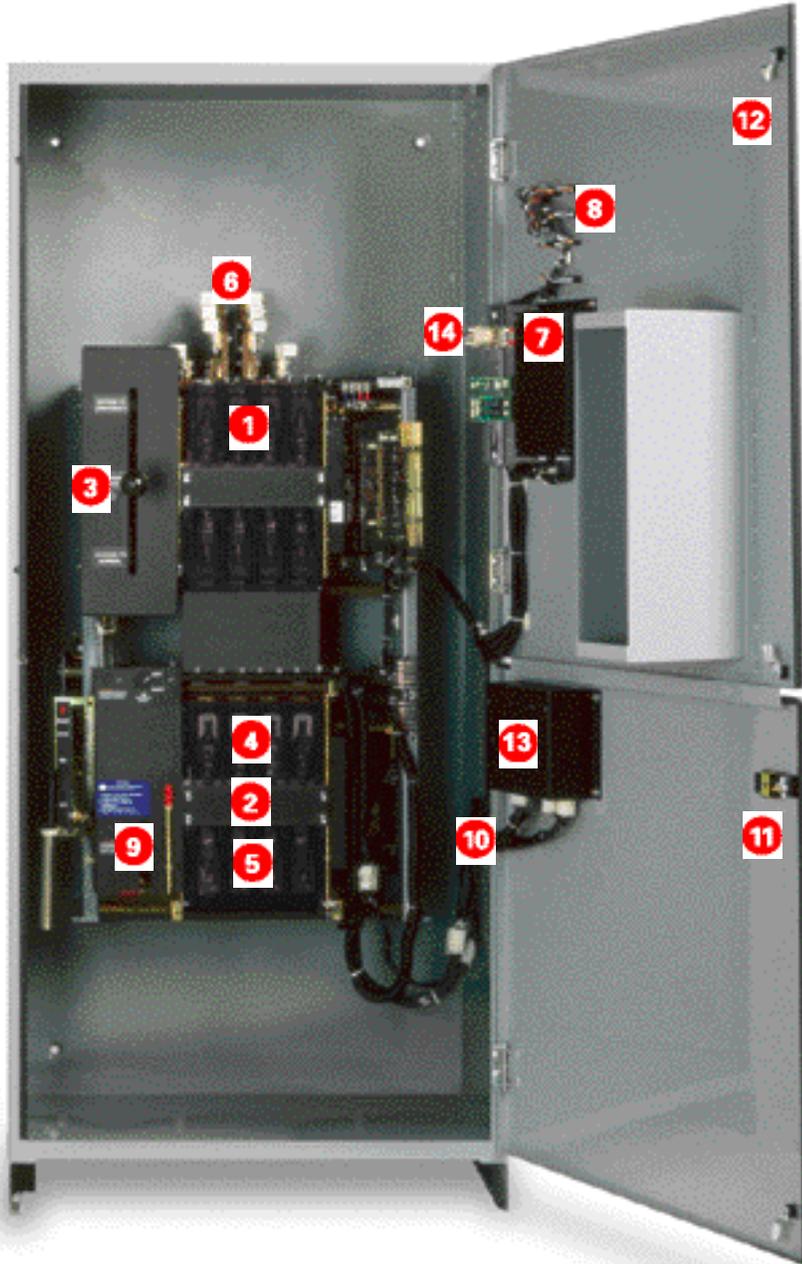
ZTSD Delayed Transition



LOAD

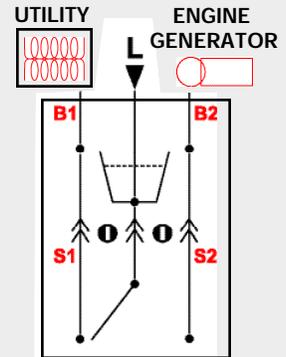
ZTSCT Closed Transition



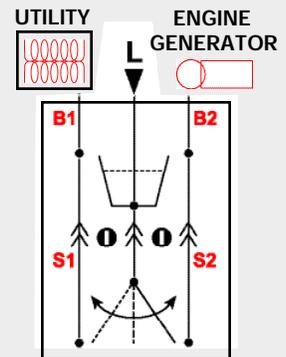


- 1 - Bypass Switch
- 2 - Automatic Transfer Switch
- 3 - Bypass Manual Operator
- 4 - Source 1 Transfer Switch Contacts
- 5 - Source 2 Transfer Switch Contacts
- 6 - Source 1&2 Incoming Cable Connections, Load Output Connections
- 7 - Microprocessor Control Panel
- 8 - Isolation/Bypass Mimic Panel
- 9 - Drive Solenoid (behind cover)
- 10 - Control Panel/Power Panel Interconnect Harness
- 11 - Transfer Switch Access Door
- 12 - Bypass Switch Access Door
- 13 - Transformers/Drive Relays
- 14 - Customer Control Connections

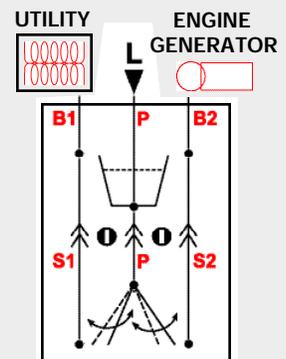
Automatic Transfer Bypass / Isolation



ZBTS Standard Transition
(No Center Position)



ZBTSD Delayed Transition
(With Center OFF Position)
NOTE: "OFF" Position indicates neither source connected



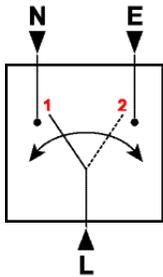
ZBTSCT Closed Transition
(Make-Before-Break Operation)
NOTE: "P" Position indicates both sources paralleled for 3-6 cycles





ZTSL300FC

Automatic Transfer Switch
3000 amp, 4 pole



The **ZTS SERIES** is the foundation of the transfer switch product line. This ruggedly built power contactor family of switches has been specifically designed for transfer switch duty with dependability, versatility and user friendliness of prime concern.

ZTS switches are available in open type construction for switchboard installation or NEMA enclosed to the customer's specifications. The power panel components, consisting of power switching contacts, drive mechanism and terminal lugs, are mounted on a specially formed panel. Logic devices including microprocessor control auxiliary time delays and special accessory equipment are assembled on the door for ease of maintenance and separation from the power section. They are connected with a numbered wiring harness equipped with a disconnect plug that allows isolation of the control panel for maintenance.

ZTS Series Operation

When the normal source fails or the voltage drops to a predetermined point (usually 80% of nominal), if required, a circuit is closed to start the engine generator set. When the emergency source reaches 90% of rated voltage and 95% of rated frequency, the drive solenoid is energized through the emergency coil

control relay, causing the main contacts to disconnect the load from the normal source and connect it to the emergency source. After the drive solenoid has completed its electrical stroke and is locked, the emergency coil control relay opens to deenergize it. The transfer switch is now mechanically locked in the emergency position.

When normal voltage is restored to a predetermined point (usually 90% of nominal), the control voltage sensing energizes. The normal side coil control relay closes, and after the drive solenoid has completed its electrical stroke and is locked, the coil control relay opens to deenergize it. The transfer switch is now mechanically locked in the normal position.

Drive Mechanism

All GE Zenith ZTS switches employ the simple "over-center" principle to achieve a mechanically locked position in either normal or emergency. GE Zenith's high speed drive assures contact transfer in 100 ms or less. High contact pressure and positive mechanical lock allow for high withstand and closing ratings, far exceeding UL requirements. All ATS units are listed with UL umbrella breaker and current limiting fuse ratings.

Electrical Ratings

- Ratings 40 to 4000 amperes
- 2, 3 or 4 Poles
- Open type, 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

- Contact transfer speed less than 100 milliseconds
- High close-in and withstand capability
- Temperature rise test per UL 1008 conducted after overload and endurance tests - exceeds UL requirements
- Available in:
 - ZTS (utility-generator)
 - ZTSU (utility-utility)
 - ZTSG (generator-generator)
 - ZTSM (manual) configurations

Design and Construction Features

- Double throw, interlocked operation
- Electrically operated, mechanically held by a simple, over-center mechanism
- Segmented silver tungsten alloy contacts with separate arcing contacts on 600 amp and above
- Arc quenching grids, enclosed arc chambers, and wide contact air gap for superior source-to-source isolation on all units
- Control circuit disconnect plug for 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

Neutral Switching

The GE Zenith ZTS Series is available in true four pole designs for multi-source power systems that require switching the neutral. The neutral contact is on the same shaft as the associated main contacts. This ensures positive operation, and avoids any possibility that the neutral contact will fail to open or close, as is possible when the neutral pole is an add-on accessory. The neutral contacts are identical to the main contacts, having the same current carrying and high withstand/closing ratings as the mains. They are designed to *break last and make first* to reduce the possibility of transients while switching the neutral.

Safe Manual Operation

The ZTS manual operator consists of a large, easy-to-use handle that fits securely for manual operation during installation and maintenance or in an emergency. Fully enclosed wrap-around arc covers shield the main contacts and mechanical components. Manual operation under load with voltage level verification is available as an option.

Transferring Large Motor or Highly Inductive Loads

Some loads, particularly large motors receive severe mechanical stress if power is transferred out of phase while the motor is still rotating. Also, back EMF generated by a motor can result in over currents that can blow fuses or trip circuit breakers. To address these problems, GE Zenith offers these four solutions:

1. Accessory A6: This load control disconnects a large motor via its control circuit for an adjustable period of time prior to transfer in either direction. For switching multiple motors, GE Zenith Accessory A62 disconnects the motors prior to transfer and brings them back on line sequentially.

2. Accessory R50: This module is an in-phase monitor that compares the phase angle between both sources of power and prevents transfer until the two are approximately in phase (within a self adjusting range). GE Zenith's high speed transfer action coupled with the MX series microprocessor control logic ensure closures at or near zero degree phase difference.

3. Series ZTSD: GE Zenith offers a delayed transition on transfer switches rated 40 amperes and above – the GE Zenith ZTSD Series. This programmed center-off position allows for the full decay of rotating motors or transformer fields. It can also be used for load shedding of selected circuits or other applications which require a means to disconnect the load from either source. Major UPS system manufacturers recommend delayed transition switches for proper restart sequencing of their systems.

4. Series ZTSCT: GE Zenith's series of closed transition switches combine ZTSD operation during a source failure with a highly engineered control system that allows momentary paralleling (<100 ms) of two acceptable sources, thereby limiting the impact of transfer on the load.



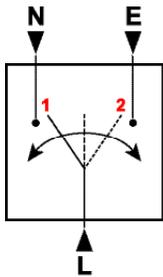
ZTSD

Series Delayed Transition Transfer Switches



ZTSDL40EC

Delayed Transition Transfer Switch
400 amp, 3 pole



The ZTSD Series 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 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. Major UPS manufacturers strongly recommend the use of delayed

transition type transfer switches to ensure proper operation of their rectifier circuit and battery system. The ZTSD Series allows a UPS system sufficient delay to recognize a power failure and transfer to batteries, acknowledge the return of power and allow the rectifier to *walk onto* the new source, reducing any transfer anomalies.

Except for the delayed transition period, the performance, operating capabilities, ratings, UL listings, with-stand current values and available options are identical to those of the GE Zenith ZTS Series Automatic Transfer Switches.

The ZTSD incorporates all of the important features of the standard ZTS Series switch as well as features oriented toward its specific operation.



Electrical Ratings

- Ratings 40 to 4000 amperes
- 2, 3 or 4 Poles
- Open type, 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 - exceeds UL requirements
- Available in:
 - ZTSD (utility-generator)
 - ZTSDU (utility-utility)
 - ZTSDG (generator-generator)
 - ZTSDM (manual) configurations

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 600 amp and above
- Arc quenching grids, enclosed arc chambers, and wide contact air gap for superior source-to-source isolation on all units
- Control circuit disconnect plug for 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

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 an unsynchronized secondary 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, 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 GE Zenith ZTSD Series Delayed Transition Transfer Switches have been designed expressly for this purpose.

The advantages of using the ZTSD Series 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-of or disconnected position*
- *Allows UPS systems to function properly while switching between line input sources*

Description and Operation

The operation of the ZTSD Series Delayed Transition Transfer Switch is identical to the GE Zenith ZTS Series 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 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 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 ZTS Series are also supplied on the ZTSD Series.



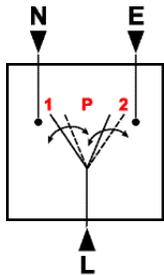
ZTSCT

Series Closed Transition Switches



ZTSCTL80EC

Closed Transition Transfer Switch
800 amp, 3 pole



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, 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 power interruptions.

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, GE Zenith offers the ZTSCT Closed Transition Transfer Switch and ZBTSCT Closed Transition Transfer/Bypass Switch.

These products utilize the proven switching technology of the ZTS/ZTSD Series of transfer switches combined with controls developed during GE Zenith'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 GE Zenith's 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 ZTSCT 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 ZTSCT Series operates as a delayed transition switch (ZTSD 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.

Electrical Ratings

- Ratings 100 to 4000 amperes
- 2, 3 or 4 Poles
- Open type, NEMA 1, 3R, 4, 4X and 12
- Available in Transfer Switch (ZTSCT) or Transfer/Bypass Switch (ZBTSCT) 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 ZTS and ZBTS Series
- Source parallel time of less than 100 milliseconds
- Closed transition operation (no power interruption) during transfer and retransfer when sources are within specified parameters
- Open transition transfer operation is initiated upon a source failure
- Available in:
 - ZTSCT (utility-generator)
 - ZTSCTU (utility-utility)
 - ZTSCTM (manual) configurations

Design and Construction Features

- Electrically operated, mechanically held
- Segmented silver tungsten alloy contacts with separate arcing contacts on 600 amps and above
- 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
- Control circuit disconnect plug for maintenance
- Mechanical indicator and contact chamber cover designed for inspection, safety and position designation

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 normally a substitute for a UPS system as it does not provide stored energy capability but rather acts in a complementary fashion.

- *System application requirements:*

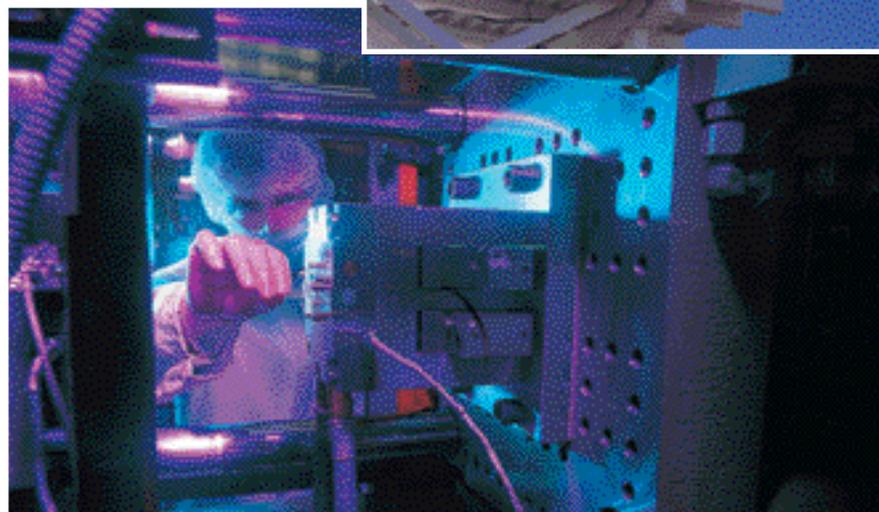
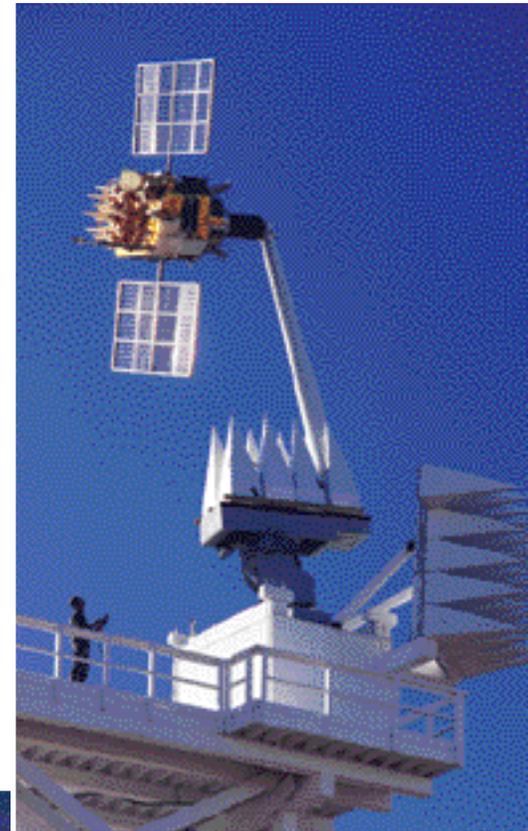
The generator set must be provided with an isochronous governor stable at a frequency differential of not more than +/- .25% from 60 Hz.

A 24VDC 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 may be supplied from the engine starting batteries or an equivalent source.

- *Option SL - Soft Load:*

When conditions are most sensitive to generator voltage drop or frequency dips, GE Zenith can provide a variation of the closed transition method of transfer which combines the attributes of a ZTSCT with generator paralleling switchgear. Employing automatic synchronizing along with active loading controls and a greater interconnect (parallel) time to form a soft-loading/closed transition ATS, GE Zenith controls the response of the engine generator set to varying load conditions.

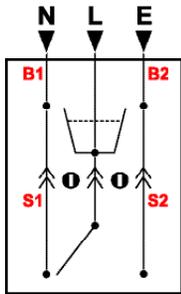
As this method of transfer interconnects the utility and generator sources for a longer period (seconds rather than cycles), greater coordination with the utility company is necessary. Typically, more sophisticated relay protection schemes will be required, therefore we suggest specifying option SL on your ZTSCT (SL) or ZBTSCT (SL) unit and consulting with your GEZenith representative.





ZBTSL120EC

Transfer/Bypass-Isolation Transfer Switch
1200 amp, 3 pole



The automatic transfer switch is the 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, GE Zenith offers the ZBTS Series Bypass-Isolation Transfer Switch.

Description and Operation

The ZBTS 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 GE Zenith ZTS Series, built in ZTS, ZTSD or ZTSC configuration and constructed for reliable operation. The same components, heavy-duty silver alloy contacts, rugged drive mechanism and silver plated bus bar interconnections are used throughout the ZBTS Series.

The bypass section is a basic ZTS switch provided with a quick make/quick break manual load transfer handle and GE Zenith's 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:

Electrical Ratings

- Ratings 100 to 4000 amperes
- 2, 3 or 4 Poles
- Open type, NEMA 1, 3R, 4, 4X and 12
- Available with ZTS, ZTSD and ZTSC 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 - exceeds UL requirements
- Available in:
 - ZBTS (utility-generator)
 - ZBTSU (utility-utility)
 - ZBTSG (generator-generator)
 - ZBTSM (manual)
- configurations; models include standard, delayed and closed transition

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 the 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
- Silver plated copper bus interconnection of the transfer and bypass switches on all sizes

1. **Automatic:**The transfer switch is carrying the load, and the bypass switch is in the open position. This is the normal operating mode.
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 ZTS Transfer Switch is installed on a draw-out mechanism, with electrical and mechanical interlocks for secure removal after the load has been bypassed. The ZTS 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 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.

GE Zenith'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 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 is furnished with a detailed step by step operating instruction plate as well as the following functional 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

ZBTSC Series – Closed Transition Transfer/Bypass-Isolation Switches

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

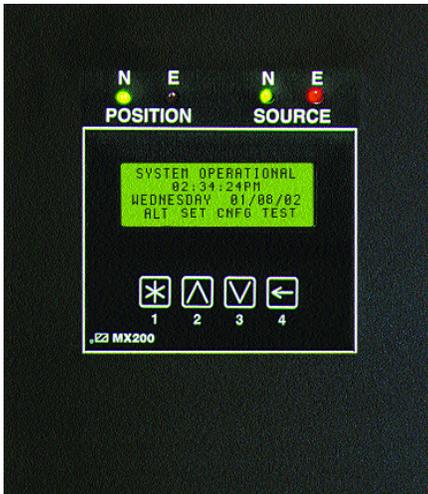
ZBTSD Series – Delayed Transition Transfer/Bypass-Isolation Switches

The ZTSD Delayed Transition Transfer Switch with a timed center-off position is available in a bypass configuration. The ZBTSD Series 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 operational description for more details.



MX200

Microprocessor Controller



GEZenith's MX200 advanced microprocessor controller manages switch operation via a convenient touchpad which provides indication setting and diagnostic capabilities. As an embedded digital controller, the device offers high reliability and ease of unattended operation across a range of applications.

The MX200 controller is designed for the most demanding transfer or bypass switch applications. The MX200 may be specified with any of our standard option Modules 12 through 31 or it may be programmed to use any or all of the most common options for today's transfer switch equipment. It may also be equipped with our ZNET200 remote communication interface for use with annunciators, modems or PC control.

Standard features include pass code protection, load/no load/fast test feature, commit/no commit transfer selection, backlit/temperature compensated LCD display, watchdog circuit for microprocessor operation, diagnostic displays for ease of maintenance, source connection and transfer data logging and many additional features. The MX200's back-lit weather and tamper resistant control interface make it an ideal choice for a wide range of applications.

Certain applications may require a discreet logic control panel such as our Solid State Relay Control Panel (SSRCP). GE Zenith can meet these special needs with the highest quality assemblies. Consult the GE Zenith factory with your specific requirements and applications to determine the best power solution.

Reference GE Zenith Bulletin PB-1402 for more information on this industry leading control system.



Performance Features

- UL 1008 listed
- Ringing wave immunity per IEEE 472 (ANSI C37.90A)
- Conducted and Radiated Emissions per EN55022 Class B (CISPR 11) (Exceeds EN55011 & MILSTD 461 Class 3)
- ESD immunity test per EN61000-4-2 (Level 4)
- Radiated RF, electromagnetic field immunity test per EN61000-4-3 (ENV50140) 10v/m
- Electrical fast transient/burst immunity test per EN61000-4-4
- Surge immunity test per EN61000-4-5 IEEE C62.41 (1.2 X 50µs, 5 & 8 kV)
- Conducted immunity test per EN61000-4-6 (ENV50141)
- Voltage dips and interruption immunity EN61000-4-11

User-Friendly Operation

- Multipurpose display: LEDs for continuous monitoring of switch position and source availability; a four line by twenty character LCD display for settings, functions, programming and annunciation
- Through-the-door programming and display
- Simplified keypad entry – menu-driven system is designed for ease of use
- Built-in diagnostics with displays for ease of troubleshooting

Additional Features

- Optional programmable exerciser uses separate microcontroller with independent battery back-up to serve as clock/calendar – battery failure will not affect switch operation
- User settings are unaffected by power outages
- External communication available through ZNET – LonWorks or Modbus network interface (RS 232 and other options available) via optional GE Zenith hardware and software

Technical Benefits

- Separate line voltage components for controller isolation
- Inputs optoisolated for high electrical immunity to transients and noise
- Built-in electrical operator protection
- Simplified maintenance – major components are easily replaceable
- Close differential under-voltage sensing of the normal source
- Voltage and frequency sensing of the emergency source (all settings are adjustable)

Today's power and control applications are varied and complex. Remote monitoring and control of transfer switches and switchgear systems as well as interface into building management controls are increasingly important to the safe and economical operation of a facility.

GE Zenith's ZNET control and communication network provides a wide selection of options for your application. The MX200 microprocessor is standard with communication capability. The optional LonWorks or ModBus network interfaces plug into the processor base and can be connected to a variety of network options including:

- Network annunciators
- Modems
- Desk top or wall mounted PC workstations
- Paralleling switchgear PLC gateways for control or SCADA interface

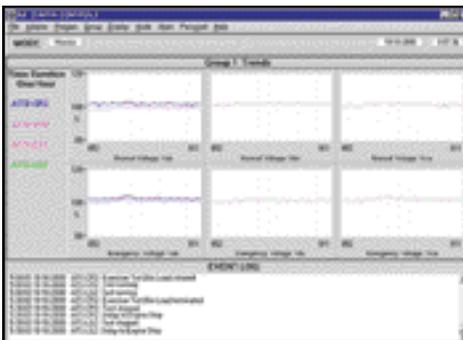
The ZNET network can include ZTS series switches with the MX200 control, as well as GE Zenith's ZTG switches with the MX100

controller, older units that can be retrofit with the ZNET90 interface module and competitive switches with the ZNET50 module. Consult your GE Zenith representative for more information on capabilities.

The ZNET network system provides direct control over system parameters, alarm functions and data logging.



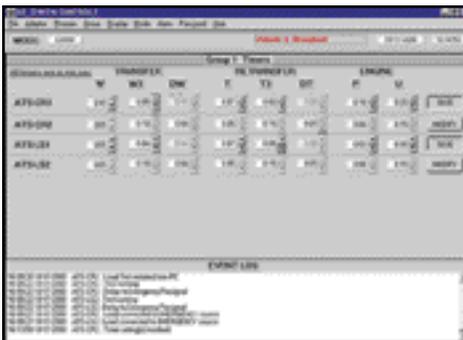
Voltage and Frequency Screen



Trend Screen



Status Screen



Timers Screen



Auxiliary Screen

Settings and data include:

- ATS position and source availability including bypass-isolation position
- Remote test (load/no load/fast test)
- Test and exercise status
- Time delay operation and settings
- Load shed operation and status
- Settings for pickup/dropout of normal and emergency voltage and frequency sensing
- Transfer inhibit
- Switch serial number, network address, name, location, model, accessories
- Time in normal/emergency positions
- Number of switch transfers
- Controller operation, switch not in automatic
- Two optional control/monitor auxiliary functions
- Trending/Analysis



- A** Auxiliary Contacts:
- A1** Operates on normal line failure (SPDT)
 - A1E** Operates on emergency line failure (SPDT)
 - A3** Closed when switch is in emergency position
 - A4** Closed when switch is in normal position
 - A6** Deenergizes external motor control circuit 5 seconds (adjustable) prior to transfer in either direction
- B** Battery Chargers
- C** Plant Exerciser (no load): Automatically starts the generator to run unloaded at selected intervals (7 day clock operation)
- C/D** Plant Exerciser (load/no load): Allows the generator to start and run unloaded or to simulate a power failure, start generator and run under load; specify weekly, bi-weekly or calendar (365 day) schedule
- D** Plant Exerciser (load): Automatically starts the generator to run loaded at selected intervals (7 day clock operation)
- E** Engine Start Contact
- F** Fan Contact: Closed when engine runs (S.P.N.O.)
- H** Time Delay - Engine Start: Non-adjustable delay on starting engine after normal failure; factory set at 3 seconds; includes accessory E
- HT** Heater and Thermostat
- J** Frequency Sensors: All ZTS Automatic Transfer Switches having an engine generator as the emergency source are supplied with a sensor to prevent transfer until the emergency power reaches 90% of rated voltage and 95% of frequency (adjustable)
Additional frequency sensors are available:
- J1N** Adjustable under-frequency sensor (normal)
 - J2** Adjustable solid state close differential over/under-frequency sensor (specify if for normal and/or emergency source) (J2N, J2E)
- K** Frequency Meter
- L** Indicating LED Pilot Lights:
- L1** Indicates switch in emergency position
 - L2** Indicates switch in normal position
 - L3** Indicates normal source available
 - L4** Indicates emergency source available
- M** Meters:
- M1** Ammeter: Single phase
 - M2** Ammeter: Three phase with phase selector switch
 - M3** Voltmeter: Single phase
 - M4** Voltmeter: Three phase with phase selector switch
 - M80** Power Quality Metering Series: consult factory for complete information and available products
- P1** Time Delay - Engine Start: Adjustable 0.5 to 10 seconds
- Q2** Peak Shave/Remote Load Test: Input for peak shave or remote load test; includes automatic return to normal if emergency source fails and normal is present; 120 VAC or 24 VDC
- Q3** Inhibit Transfer: Input circuit to inhibit transfer to emergency; 120 VAC or 24 VDC
- Q7** Inhibit Transfer: Input circuit to inhibit transfer to normal; 120 VAC or 24 VDC
- R1** Over-voltage Sensing: Normal (1 or 3 phase)
- R7** Over-voltage Sensing: Emergency (1 phase)
- R8** Over-voltage Sensing: Emergency (3 phase)
- R15** Load Shed Control (ZTS): Input to remote circuit for load shed from emergency to "dead" normal; 120 VAC or 24 VDC
- R15D** Load Shed Control (ZTSD): Input to remote circuit for load shed from emergency to center off position; 120 VAC or 24 VDC
- R16** Phase Sequence Sensing
- R17** Under-voltage Sensing: Emergency (3 phase)
- R50** In-Phase Monitor: Prevents transfer until two sources are in relative synchronism
- S** Selector and Disconnect Switches:
- S1** Three-position selector switch (Stop/Test/Automatic)
 - S2** Disconnect switch in series with accessory E to disconnect engine starting circuit
 - S3** Source selector switch circuit; to select either source as primary
 - S5** Auto/manual retransfer selector switch
 - S12** Auto/manual operation for ATS
- T** Time Delay on Retransfer to Normal: To delay retransfer to normal source (immediate retransfer on generator set failure); standard setting 30 minutes, adjustable 0-60 minutes
- T3/** Time Delays - Presignal for Auxiliary
- W3** Control: Prior to transfer between two live sources in either direction, provides an adjustable (factory set at 20 seconds) resignal contact closure
- U** Time Delay for Engine Cool Down: Allows engine to run unloaded after switch retransfers to normal; standard setting 5 minutes, adjustable 0-60 minutes
- W** Time Delay on Transfer to Emergency: To delay transfer to emergency after normal source failure; standard setting 1 second, adjustable 0-5 minutes
- YEN** Pushbutton Bypass of T & W Timers
- ZNET** Network communications interface card
- 6** Test Switch: A pushbutton (momentary) test switch is standard on all ZTS Automatic Transfer Switches; MX200 microprocessor switches are standard with load/no load and fast test (with load) modes and are pass code protected; other selector switches, available at additional cost, include:
- 6A** Maintained Auto - Maintained Test
 - 6B** Maintained Auto - Momentary Test (key operated)
 - 6C** Maintained Auto - Maintained Test (key operated)
- Note:** Pass code access standard on MX200 normally eliminates the need for key operated switch

Many additional accessories are available to meet your installation requirements. Consult your GE Zenith representative with your project needs.

ZTS SERIES PRODUCT								
	Option Package #	12	15	17	19	25	30	31
	Option Package Name	Standard	Exercise	Control	Sensing	Spec	Critical	PSG
Option	Description	Included						
A1	Aux. Contact - normal available		1	1	1	1	1	1
A1E	Aux. Contact - emergency available		1	1	1	1	1	1
A3	Aux. Contact - closed in emergency	1	2	2	2	2	2	3
A4	Aux. Contact - closed in normal	1	2	2	2	2	2	3
A6	Time delay motor disconnect			1		1	1	1
C/D	Exerciser clock - 7 day load/no load		1	1	1	1	1	1
E	Engine start contact	1	1	1	1	1	1	1
J2E	Over/under frequency - emergency				1	1	1	1
J2N	Over/under frequency - normal				1	1	1	1
L1	Pilot light - normal position	1	1	1	1	1	1	1
L2	Pilot light - emergency position	1	1	1	1	1	1	1
L3	Pilot light - emergency available	1	1	1	1	1	1	1
L4	Pilot light - normal available	1	1	1	1	1	1	1
P	Time delay engine start	1	1	1	1	1	1	1
Q2	Remote test/peak shave contact		1	1	1	1	1	1
Q3	Transfer inhibit to emergency			1	1	1	1	1
Q7	Transfer inhibit to normal			1			1	1
R1	Overvoltage sensing on normal				1	1	1	1
R15/D	Load shed (to normal or neutral)							1
R16	Phase sequence sensing				1	1	1	1
R17	3 phase undervoltage sensing on emergency				1	1	1	1
R50	In-phase monitor	1	1	1	1	1	1	1
R8	Overvoltage sensing on emergency				1	1	1	1
S12	Auto/manual operation selector						1	
T	Time delay retransfer to normal	1	1	1	1	1	1	1
T3/W3	Time delay elevator presignal			1			1	1
U	Time delay engine cooldown	1	1	1	1	1	1	1
W	Time delay transfer to emergency	1	1	1	1	1	1	1
YEN	Pushbutton - bypass T/W timers		1	1	1	1	1	1

AL-CU UL Listed Solderless Screw-Type Terminals for External Power Connections							
Switch Size Amps	Normal, Emergency & Load Terminals			Switch Size Amps	Normal, Emergency & Load Terminals		
	Cables per Pole	Range of Wire Sizes			Cables per Pole	Range of Wire Sizes	
40-150	1	#8 to 3/0 AWG	6-70 MM	800/1000/1200	4	#2 AWG to 600 MCM	25-300 MM
225		#6 AWG to 250 MCM	10-120 MM	1600			
260		#6 AWG to 350 MCM	10-150 MM	2000			
400		#4 AWG to 600 MCM	16-300 MM	3000			
600	2	#2 AWG to 600 MCM	25-300 MM	4000			

Line and load terminals are located in rear and arranged for bus bar connection.
Terminal lugs are available at additional cost.
Contact factory for more details.

Notes:

1. Special terminal lugs and neutral bars are available at additional cost. Contact factory and advise cable sizes and number of conductors per pole.
2. Fully rated solid neutral (3x standard normal power connection) provided when required by system voltage.
3. Normal and emergency may be ordered inverted on any switch. Load may be inverted 600-1200 amps. Consult the factory for details.
4. Lug adapters for 3000-4000 amp units may be staggered length for ease of entrance. Consult the factory for details.
5. Special lug arrangements may require different enclosure dimensions. For certified drawings, contact the GE Zenith factory.

GE Zenith ZTS Series Automatic Transfer Switches 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 engineering firms throughout the world. The primary test to ensure the quality and dependability of an automatic transfer switch is its ability to close into and withstand high fault currents. The table shows the Underwriters Laboratories and Canadian Standards certified withstand and closing current ratings in symmetrical rms amperes at 480 and 600 volts ac.

GE Zenith ZTS Switches Rated for Total Systems or Motor Loads (1)		Withstand and Closing Current Ratings per UL 1008 and CSA							
GE Zenith Model No.	UL 1008 ZTSSwitch Rating	Current Limiting Fuse			Specific Coordinated Breaker Rating (3)			Any Molded Case Breaker Rating	
		Maximum Fuse Size Amps	Maximum Circuit Amps at 480 VAC (UL)	Maximum Circuit Amps at 600 VAC (CSA)	Maximum Circuit Breaker Size Amps	Maximum Circuit Amps at 480 VAC (UL)	Maximum Circuit Amps at 600 VAC (CSA)	Maximum Circuit Amps at 480 VAC (UL)	Maximum Circuit Amps at 600 VAC (CSA)
ZTS4 (2)	40	50	200,000	150,000	400	30,000	22,000	10,000	10,000
ZTS8 (2)	80	100	200,000	150,000	400	30,000	22,000	10,000	10,000
ZTS10 (2)	100	125	200,000	150,000	400	30,000	22,000	10,000	10,000
ZTS15 (2)	150	200	200,000	150,000	400	30,000	22,000	10,000	10,000
ZTS22 (2)	225	300	200,000	150,000	400	50,000	42,000	35,000	30,000
ZTS26 (2)	260	350	200,000	150,000	400	50,000	42,000	35,000	30,000
ZTS40 (2)	400	500	200,000	150,000	800	50,000	42,000	35,000	30,000
ZTS60	600	750	200,000	150,000	800	65,000	50,000	50,000	42,000
ZTS80	800	1000	200,000	150,000	1200	65,000	50,000	50,000	42,000
ZTS100	1000	1250	200,000	150,000	1600	85,000	65,000	50,000	42,000
ZTS120	1200	1500	200,000	150,000	1600	85,000	65,000	50,000	42,000
ZTS160	1600	2000	200,000	150,000	2500	100,000	85,000	100,000	85,000
ZTS200	2000	2500	200,000	150,000	2500	100,000	85,000	100,000	85,000
ZTS300	3000	4000	200,000	150,000	4000	100,000	85,000	100,000	85,000
ZTS400	4000	6000	200,000	150,000	5000	100,000	85,000	100,000	85,000
ZBTS10 (2)	100	125	200,000	150,000	800	50,000	42,000	35,000	30,000
ZBTS15 (2)	150	200	200,000	150,000	800	50,000	42,000	35,000	30,000
ZBTS22 (2)	225	300	200,000	150,000	800	50,000	42,000	35,000	30,000
ZBTS26 (2)	260	350	200,000	150,000	800	50,000	42,000	35,000	30,000
ZBTS40 (2)	400	600	200,000	150,000	800	50,000	42,000	35,000	30,000
ZBTS60	600	750	200,000	150,000	800	65,000	50,000	50,000	42,000
ZBTS80	800	1000	200,000	150,000	1600	85,000	65,000	50,000	42,000
ZBTS100	1000	1250	200,000	150,000	1600	85,000	65,000	50,000	42,000
ZBTS120	1200	1500	200,000	150,000	1600	85,000	65,000	50,000	42,000
ZBTS160	1600	2500	200,000	150,000	2500	100,000	85,000	100,000	85,000
ZBTS200	2000	2500	200,000	150,000	2500	100,000	85,000	100,000	85,000
ZBTS300	3000	4000	200,000	150,000	4000	100,000	85,000	100,000	85,000
ZBTS400	4000	6000	200,000	150,000	5000	100,000	85,000	100,000	85,000
ZTSD4 (2)	40	50	200,000	150,000	150	50,000	42,000	35,000	30,000
ZTSD8 (2)	80	100	200,000	150,000	150	50,000	42,000	35,000	30,000
ZTSD10 (2)	100	125	200,000	150,000	150	50,000	42,000	35,000	30,000
ZTSD15 (2)	150	200	200,000	150,000	400	50,000	42,000	35,000	30,000
ZTSD22 (2)	225	300	200,000	150,000	400	50,000	42,000	35,000	30,000
ZTSD26 (2)	260	350	200,000	150,000	400	50,000	42,000	35,000	30,000
ZTSD40 (2)	400	600	200,000	150,000	800	50,000	42,000	35,000	30,000

ZTSD 600 amp - 4000 amp – Ratings identical to ZTS Series
 ZTSCT and ZBTSCT 100 amp - 4000 amp – Ratings identical to ZBTS Series

Notes:

- For each rating attained in above table, the heat run was performed after the overload and endurance tests.
- These models also listed for 100% tungsten lamp loads.
- Consult factory for coordinated breaker types and ratings, or see publication TB7102.
- All transfer switches are rated in coordination with the protective device installed. Lower rated devices than those shown may be utilized and the system rated accordingly.
- Consult the factory for IECratings.

ZTS Series Transfer Switches								
Ampere Rating	Poles	NEMA 1 Enclosed			Reference Figure	Weight		Application Notes
		Height (A)	Width (B)	Depth (C)		Open Type	NEMA 1	
40, 80 100, 150	2, 3, 4	24 (61)	18 (46)	10 (26)	A	21 (10)	57 (26)	1-7
		24 (61)	18 (46)	10 (26)	A	24 (11)	60 (27)	
225, 260 400	2, 3, 4	46 (117)	24 (61)	14.13 (36)	A	70 (32)	165 (75)	1-7
		46 (117)	24 (61)	14.13 (36)	A	75 (34)	170 (68)	
600	2, 3, 4	66 (168)	24 (61)	19.75 (50)	B	165 (75)	380 (172)	1-8
		74 (188)	30 (76)	19.75 (50)	B	185 (84)	430 (195)	
800, 1000, 1200	2, 3, 4	74 (188)	30 (76)	19.75 (50)	B	190 (86)	455 (206)	1-8
		74 (188)	40 (102)	19.75 (50)	B	210 (95)	540 (245)	
1600 2000	3	90 (229)	30 (76)	48 (122)	C	345 (156)	1010 (458)	1-8
	4	90 (229)	36 (91)	48 (122)	C	450 (204)	1160 (526)	
3000	3	90 (229)	30 (76)	48 (122)	C	465 (211)	1130 (513)	1-8, 12, 13
	4	90 (229)	36 (91)	48 (122)	C	670 (304)	1395 (633)	
4000	3	90 (229)	40 (102)	60 (152)	C	770 (349)	1595 (723)	1-8, 11, 12, 13
	4	90 (229)	46.5 (118)	60 (152)	C	1025 (465)	1850 (839)	

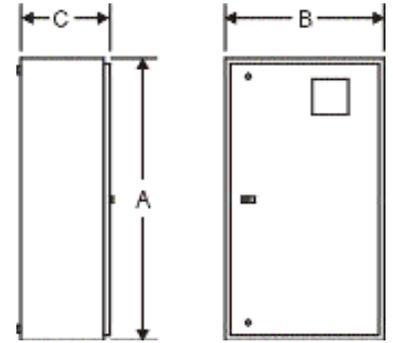


Figure A

ZTSD Series Delayed Transition Transfer Switches								
Ampere Rating	Poles	NEMA1 Enclosed			Reference Figure	Weight		Application Notes
		Height (A)	Width (B)	Depth (C)		Open Type	NEMA 1	
40, 80 100, 150 225, 260, 400	2, 3, 4	46 (117)	24 (61)	14.13 (36)	A	80 (36)	200 (91)	1-7
		46 (117)	24 (61)	14.13 (36)	A	85 (39)	205 (93)	
600	2, 3, 4	66 (168)	24 (61)	19.75 (50)	B	185 (84)	400 (181)	1-8
		74 (188)	30 (76)	19.75 (50)	B	205 (93)	450 (204)	
800, 1000 1200	2, 3, 4	74 (188)	30 (76)	19.75 (50)	B	210 (95)	475 (215)	1-8
		74 (188)	40 (102)	19.75 (50)	B	230 (104)	560 (254)	
1600 2000	3	90 (229)	30 (76)	48 (122)	C	365 (166)	1030 (467)	1-8
	4	90 (229)	36 (91)	48 (122)	C	470 (213)	1190 (540)	
3000	3	90 (229)	30 (76)	48 (122)	C	485 (220)	1150 (522)	1-8, 12, 13
	4	90 (229)	36 (91)	48 (122)	C	690 (313)	1415 (642)	
4000	3	90 (229)	40 (102)	60 (152)	C	790 (358)	1615 (732)	1-8
	4	90 (229)	46.5 (118)	60 (152)	C	1045 (474)	1870 (848)	

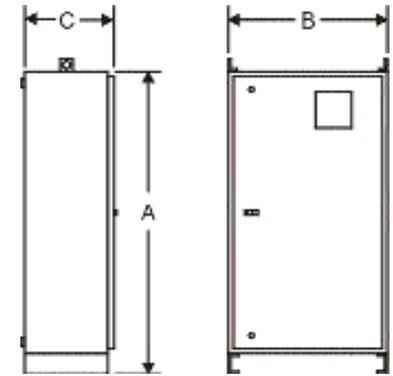


Figure B

ZTSCT Series Closed Transition Transfer Switches								
Ampere Rating	Poles	NEMA1 Enclosed			Reference Figure	Weight		Application Notes
		Height (A)	Width (B)	Depth (C)		Open Type	NEMA 1	
100, 150 225, 260 400	2, 3, 4	74 (188)	30 (76)	19.75 (50)	B	170 (77)	435 (197)	1-8
		74 (188)	30 (76)	19.75 (50)	B	175 (79)	440 (200)	
600	2, 3, 4	74 (188)	30 (76)	19.75 (50)	B	235 (107)	500 (227)	1-8
		74 (188)	30 (76)	19.75 (50)	B	255 (116)	520 (236)	
800, 1000 1200	3	74 (188)	30 (76)	19.75 (50)	B	260 (118)	525 (238)	1-8
	4	74 (188)	40 (102)	19.75 (50)	B	280 (127)	610 (277)	
1600 2000	3	90 (229)	40 (102)	48 (122)	C	415 (188)	1140 (517)	1-8
	4	90 (229)	40 (102)	48 (122)	C	520 (236)	1305 (592)	
3000	3	90 (229)	40 (102)	48 (122)	C	535 (243)	1260 (572)	1-8, 13, 14
	4	90 (229)	40 (102)	48 (122)	C	740 (336)	1465 (665)	
4000	3	90 (229)	40 (102)	60 (152)	C	840 (381)	1665 (755)	1-8, 11, 12, 13
	4	90 (229)	46.5 (118)	60 (152)	C	1095 (497)	1920 (871)	

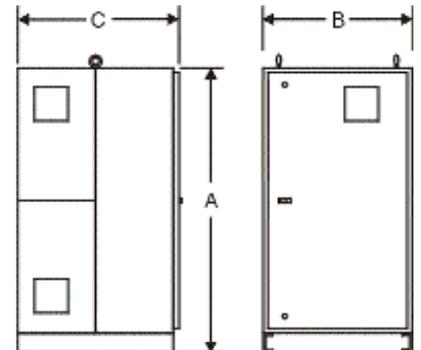


Figure C

ZBTS, ZBTSD Series Transfer / Bypass - Isolation Switches								
Amper e Rating	Poles	NEMA1 Enclosed				Weight		Application Notes
		Height (A)	Width (B)	Depth (C)	Reference Figure	Open Type	NEMA 1	
100, 150 225, 260 400	2, 3, 4	83 (211) 83 (211)	30 (76) 36 (91)	25.25 (64) 25.25 (64)	D D	335 (152) 445 (202)	775 (342) 895 (406)	1 - 8
600	3 4	90 (229) 90 (229)	36 (91) 40 (102)	28.25 (72) 28.25 (72)	E E	660 (299) 770 (349)	1220 (533) 1365 (619)	1 - 9
800, 1000 1200	3 4	90 (229) 90 (229)	40 (102) 46 (117)	28.25 (72) 28.25 (72)	E E	765 (347) 910 (413)	1355 (615) 1570 (712)	1 - 9
1600 2000	3 4	90 (229) 90 (229)	40 (102) 50 (127)	61.25 (156) 61.25 (156)	F F	2900 (1315) 3800 (1724)	3100 (1406) 4000 (1814)	1 - 7, 10
3000	3 4	90 (229) 90 (229)	40 (102) 50 (127)	73.25 (186) 73.25 (186)	F F	3700 (1678) 4800 (2177)	3900 (1769) 5000 (2268)	1 - 7 10, 12, 13
4000	3 4	90 (229) 90 (229)	47.5 (121) 54 (137)	80 (203) 80 (203)	F F	4310 (1955) 5510 (2499)	4660 (2113) 5860 (2658)	1 - 7, 10 - 13

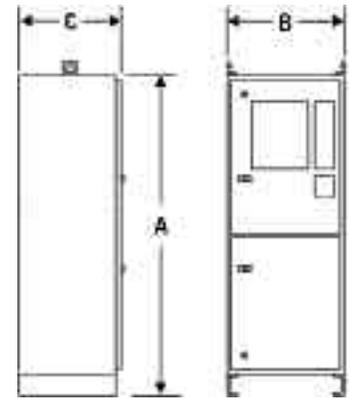


Figure D

ZBTSCT Series Closed Transition Transfer / Bypass - Isolation Switches								
Amper e Rating	Poles	NEMA1 Enclosed				Weight		Application Notes
		Height (A)	Width (B)	Depth (C)	Reference Figure	Open Type	NEMA 1	
100, 150 225, 260 400	2, 3, 4	83 (211) 83 (211)	40 (102) 40 (102)	25.25 (64) 25.25 (64)	D D	390 (177) 505 (229)	1005 (456) 1145 (519)	1 - 8
600	3 4	90 (229) 90 (229)	40 (102) 40 (102)	28.25 (72) 28.25 (72)	E E	730 (331) 840 (381)	1280 (581) 1385 (628)	1 - 10
800, 1000 1200	3 4	90 (229) 90 (229)	40 (102) 46 (117)	28.25 (72) 28.25 (72)	E E	835 (379) 980 (444)	1435 (651) 1640 (744)	1 - 10
1600 2000	3 4	90 (229) 90 (229)	40 (102) 50 (127)	61.25 (156) 61.25 (156)	F F	2970 (1347) 3870 (1755)	3170 (1438) 4070 (1846)	1 - 7, 11
3000	3 4	90 (229) 90 (229)	40 (102) 50 (127)	73.25 (186) 73.25 (186)	F F	3770 (1710) 4870 (2209)	3970 (1801) 5070 (2300)	1 - 7 12, 13
4000	3 4	90 (229) 90 (229)	47.5 (121) 54 (137)	80 (203) 80 (203)	F F	4380 (1986) 5580 (2531)	4730 (2145) 5930 (2689)	1 - 7, 10 - 13

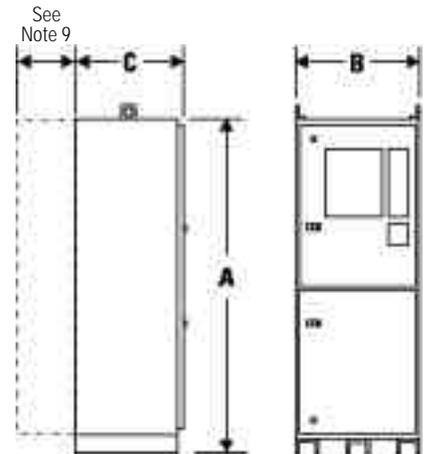


Figure E

Application Notes:

- Metric dimensions (cm) and weights (Kg) shown in parenthesis adjacent to English measurements in inches and pounds.
- 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.
- Special enclosures (NEMA 3R, 4, 12, etc.) dimensions and layout may differ. Consult the GEZenith factory for details.
- Normal and emergency may be ordered inverted on any switch. The load may be inverted 600-1200 amps. Consult the factory for details.
- Special lug arrangements may require different enclosure dimensions. For certified drawings, contact the GEZenith factory.
- 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.
- ZBTS 600-1200 standard configuration is top entry. 14" rear adapter bay required for bottom entry. Consult GEZenith factory for details.
- Bypass switch weights for 1600-4000 amp units vary up to 10% based on connection configurations. Weights shown are for estimation only.
- 4000 amp depth dimension shown is standard. Depending on your cable/conduit requirements you may desire a deeper enclosure. Consult the GEZenith factory for further details.
- Lug adapters for 3000-4000 amp limits may be staggered length for ease of entrance. Consult the GEZenith factory for details.
- Ventilation louvers on side/rear of enclosure at 3000 and 4000 amps. One side or rear must be clear for airflow with standard cable connections.

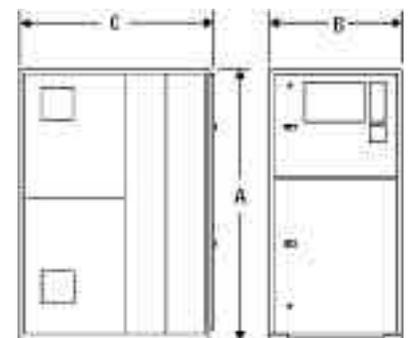


Figure F



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