



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
1	C077003	09/23/19	AR MAS

**ZTSD SERIES WITH MX250 MICROPROCESSOR-BASED CONTROL PANEL
AUTOMATIC TRANSFER SWITCH (ATS)
40-4000 AMP**

FOR USE ON EMERGENCY OR STANDBY SYSTEMS – RATED FOR TOTAL SYSTEM & MOTOR LOAD

A. LEGEND

DS..... Disconnect Switch
DT..... Time Delay to SOURCE 1
DW..... Time Delay to SOURCE 2
L1..... SOURCE 2 Position Light
L2..... SOURCE 1 Position Light
L3..... SOURCE 1 Available Light
L4..... SOURCE 2 Available Light

Controls Power Supply (CPS)
XE1,XE2 Control Transformer, SOURCE 2
XN1,XN2.....Control Transformer, SOURCE 1

Power Panel
N1,2,3,(N)... SOURCE 1 Line _____
E1,2,3,(N)... SOURCE 2 Line _____
T1,2,3,(N)... Load Connections
CE..... SOURCE 2 Transfer Operator
CE1..... SOURCE 2 Transfer Operator
 (4000 Amp)
CEO..... Transfer Operator, Open SOURCE 2
CEO1..... Transfer Operator, Open SOURCE 2
 (4000 Amp)
CN SOURCE 1 Transfer Operator
CN1 SOURCE 1 Transfer Operator
 (4000 Amp)
CNO..... Transfer Operator, Open SOURCE 1
CNO1..... Transfer Operator, Open SOURCE 1
 (4000 Amp)
GND..... Ground
NB..... Neutral Bar (if required)
SCR-E..... SCR Source 2
SCR-NO..... SCR Source 1 open
SCR-N..... SCR Source 1
SCR-EO..... SCR Source 2 open
SE SOURCE 2 Position
SEO..... SOURCE 2 Open Position
SN SOURCE 1 Position
SNO..... SOURCE 1 Open Position

Disconnect Switch

When the Disconnect Switch is placed in the INHIBIT position, the MX control panel is disengaged and transfer cannot take place.

**ACCESSORY
GROUP PACKAGES:**

- C. (STDS) GROUP PACKAGE**
6, A3, A4, CALIBRATE, CDT DS, DT, DW, E, EL/P, KP, L1, L2, L3, L4, LN, P1, R50, S13, T, U, VI, W AND YEN.
- D. (EXES) OPTION PACKAGE**
6, A1, A1E, A3, A4, CALIBRATE, CDP DS, DT, DW, E, EL/P, KP, L1, L2, L3, L4, LN, P1, Q2, R16, R50, S13, T, U, VI, W AND YEN.
- E. (CONS) OPTION PACKAGE**
6, A1, A1E, A3, A4, CALIBRATE, CDP, DS, DT, DW, E, EL/P, KP, L1, L2, L3, L4, LN, P1, Q2, Q3, Q7, R16, R50, S13, T, T3/W3, U, UMD, VI, W AND YEN.
- F. (SENS) OPTION PACKAGE**
6, A1, A1E, A3, A4, CALIBRATE, CDP, DS, DT, DW, E, EL/P, KP, L1, L2, L3, L4, LN, P1, Q2, Q7, R1-1/R1-3, R16, R50, S12, S13, T, U, VI, W AND YEN.
- G. (SPES) OPTION PACKAGE**
6, A1, A1E, A3, A4, CALIBRATE, CDP, DS, DT, DW, E, EL/P, KP, L1, L2, L3, L4, LN, P1, Q2, Q3, Q7, R1-1/R1-3, R16, R50, S5, S13, T, T3/W3, U, UMD, VI, W AND YEN.
- H. (PSGS) OPTION PACKAGE**
6, A1, A1E, A3, A4, CALIBRATE, CDP, DS, DT, DW, E, EL/P, KP, L1, L2, L3, L4, LN, P1, Q2, Q3, Q7, R1-1/R1-3, R15, R16, R50, S12, S13, T, T3/W3, U, UMD, VI, W AND YEN.

B. OPERATION

When SOURCE 1 line drops below the preset "Fail" values, SOURCE 1 voltage sensing circuit initiates the engine start Signal.


When SOURCE 2 line voltage and frequency reach the preset "Restore" values, the MX Controller initiates a transfer signal through the SCR-NO to operate the main transfer operator. The load is now transferred to open position. After the set time delay, the MX Controller initiates a transfer signal through the SCR-E to operate the transfer operator. The load is now transferred to the SOURCE 2 line. The transfer switch is mechanically locked. SN limit switch awaits the next operation to SOURCE 1.

When SOURCE 1 line voltage reaches the preset "Restore" values, the MX controller initiates a transfer signal through the SCR-EO to operate the main transfer operator. The load is now transferred to open position. After the set time delay, the MX controller initiates a transfer signal through the SCR-N to operate the transfer operator. The load is now re-transferred back to the SOURCE 1 line. The transfer switch is mechanically locked. SE limit switch awaits the next operation to SOURCE 2.

Test Switch
The Test Switch simulates a SOURCE 1 line failure when activated. To test, activate the Test Switch, thus allowing the transfer switch to transfer to the SOURCE 2 position. De-activate the Test Switch. The transfer switch will reset to the SOURCE 1 position. Testing at least once a month is recommended. For hospital Emergency systems, test once a week.

NOTES:

- CAUTION:** In using a 3 phase, 4 wire delta or open delta power supply (usually 120/240 volts, sometimes listed as 120/208 volts) with one leg having a grounded center tap, one line will be 160 to 208 volts to ground. When such a system is used it is necessary to connect the high leg to N2. **DO NOT CONNECT 120 VOLT LOAD CIRCUIT TO THE HIGH LEG.**
- GROUNDING TERMINAL:** A grounding terminal (GND) is provided. When installing open type switches connect this terminal to the metal enclosure or an equivalent earth ground.
- WARNING – TO ENSURE AGAINST SHOCK OR ACCIDENT HAZARD, DISCONNECT ALL SOURCES OF SUPPLY BEFORE SERVICING.**
- ON SINGLE PHASE UNITS WHERE THE SOURCE 2 IS A UTILITY LINE, CONNECT SOURCE 2 LINE SO THAT MINIMUM VOLTAGE IS MEASURED FROM N1 TO E1.
- ON SINGLE PHASE (2 POLE) UNITS, CENTER POLE IS NOT SUPPLIED. RIGHT-HAND POLE IS NOT SUPPLIED ON 400 AMP UNITS.

<small>ABB PROPRIETARY AND CONFIDENTIAL INFORMATION</small> The information contained in the document has to be kept strictly confidential. Any unauthorized use, reproduction, distribution or disclosure to third parties is strictly forbidden. ABB reserves all rights regarding Intellectual Property Rights. Copyright 2018 ABB. All rights reserved.	FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE	 LEGEND, OPERATION, AND ACCESSORIES FIRST MADE FOR: ZTSD40-4000AMP SIZE CAGE CODE DWG NO 71A-0900D	
	APPLIED PRACTICES	MODEL GG	05/01/03		
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL			
	TOLERANCES ON:	CHECKED			
2 PL. DECIMALS ± .020	ENGRG FS				
3 PL. DECIMALS ± .005	MFG				
ANGLES ± 1°	QUALITY				
FRACTIONS ± 1/64	ISSUED				
FINISH	DRAWING FILE: 71a-0900d.dwg				
AutoCad Generated	MODEL / ASSEMBLY FILE: ZTSD40-4000AMP				
	# CTQs	CRITICAL TO QUALITY CHARACTERISTIC	SCALE: -	SHEET 1 OF 2	





ZTSD SERIES WITH MX250
 MICROPROCESSOR-BASED CONTROL PANEL
 AUTOMATIC TRANSFER SWITCH (ATS) 40-4000 AMP

FOR USE ON EMERGENCY OR STANDBY SYSTEMS-RATED FOR TOTAL SYSTEM & MOTOR LOAD

I. ACCESSORIES DEFINITION.

- 6 Test Switch, Momentary.
- 6A Test Switch, Maintained/Momentary. Door mount.
- 6AP Test Switch Maintained/Momentary Utilizing Keypad.
- 6B Test Switch, Maintained-Auto/Momentary-test, Key Operated.
- 6C Test Switch, Maintained-Auto/Maintained-test, Key Operated.
- A1 Auxiliary Contact, Operates on Source 1 line failure.
- A1E Auxiliary Contact, Operates on Source 2 line failure.
- A3 Auxiliary Contact Closed when the switch is in Source 2 position.
- A4 Auxiliary Contact Closed when the switch is in Source 1 position.
- A62 Sequential Universal Motor load Disconnect Circuit.
- B9 Battery charger.
- CALIBRATE Source 1 & Source 2 Calibrate capabilities for voltage a frequency.
- CDP Clock Exerciser Load / No Load, one event: allows the Generator to start and run unloaded or simulate a power failure, start Generator and run under load. Can be configured by end user for a 1, 7, 14, 28, or 365 day cycle. A total of 7 independent exercise periods (up to 10 hours each) can be programmed for each of the daily, weekly, 14-day, and 28-day Exercisers. A total of 12 independent exercise periods (up to 10 hours each) can be programmed for the 365-day Exerciser. When exercise is impending, (*E*) appears in the upper right hand corner of LCD screen. configured via CFG menu and set via SET menu.
- CDT Timer Exerciser Load / No Load, one event: allows the Generator to start and run unloaded or simulate a power failure, start Generator and run under load. Can be configured by end user for a 1, 7, 14, or 28 day cycle. Exercise duration can be set between 5 and 60 minutes in 1 minute increments. Factory default is 20 minutes. When exercise is impending, (*E*) appears in the upper right hand corner of LCD screen. configured via CFG menu and set via SET menu.
- CTAP Alarm Panel on transfer to Source 2 w/Silence button.
- DS Disconnect Switch, Auto /Inhibit. Inhibits transfer in either direction when in inhibit. Allows automatic operation when in Auto.
- DT Time delay from Neutral switch position to Source 1 position.
- DW Time delay from Neutral switch position to Source 2 position.
- E Engine Start Contact.
- EL/P Event Log: Sequentially Numbered Log of 16 events that track date, time, reason and action taken.
System Data: Total Life Transfers (N2P)
Days Powered Up
Total Transfers to S2
Total S1 Failures
Total S1 available in Hrs
Total S2 available in Hrs. (NIP)
- F Fan contact operates when generator is running.
- HT Heater and Thermostat.
- K Frequency Meter, Door mount.
- KP Frequency, LCD-Indication S1 & S2
- L Indicating LED lights.
L1 Indicates Switch in Source 2 position.
L2 Indicates Switch in Source 1 position.
L3 Indicates Source 1 available.
L4 Indicates Source 2 available.
LN center-off position LCD-indicator.

- M1 Single Phase Amp Meter
- M2 Three Phase Amp Meter
- M3 Single Phase Volt Meter
- M4 Three Phase Volt Meter
- M90 2000 Digital Power Monitor Δ
- M91 EPM 6000 Digital Power Meter w/RS485 Δ
- N1 Running Time meter, Door Mount.
- N2 Operation Counter meter, Door Mount.
- P1 Time Delay Source 2 Start. Adjustable 0 to 10 sec.
- P2 Time Delay Source 2 Start. Adjustable 1/6 to 300 sec.
- Q2 Peak Shave/Remote Load Test:Input for Peak Shave or Remote Load Test. Includes automatic return to Source 1 if Source 2 fails and Source 1 present.
- Q3 Inhibit Transfer to Source 2 Circuit.
- Q7 Inhibit Transfer to Source 1 Circuit.
- R2E Under voltage sensing of Source 2 for single-phase. (R17 replaces R2E for Utility to Utility switches)
- R1-1/R1-3 Source 1 Over Voltage sensing for single and three phase systems.
- R16 Phase Rotation Sensing
- R26 Interruptable Power Rate Provisions
- R50 In-Phase Monitor. Prevents transfer until two sources are in-phase.
- S5 Auto/Semi Manual selector, Utilizing keypad
- S12 Auto/Manual selector, Utilizing keypad
- S13 Transfer Commit or no Commit to transfer upon Engine start.
- S14 Test/Auto/Source 1 Selector, Door mount
- SW1 Auto/Off/Start Engine control selector Door mount
- SW2 Auto/Off Engine control selector Door mount
- SW3 Source Priority Selector Switch Door mount
- T Time Delay to SOURCE 1 stable timer
- T3/W3 Elevator Pre-Signal Auxiliary Contacts: Open 0-60 sec. prior to transfer to either direction, re-closes after transfer
- U Source 2 Stop Delay Timer.
- UMD Universal Motor Load Disconnect Circuit.
- VI Voltage Imbalance Sensing (Three Phase)
- W Time Delay (S2) Source 2 Stable Timer. To delay transfer to Source 2.
- YEN Bypass T and W Timers utilizing keypad.
- ZNET Network Communication Interface Card.



ABB PROPRIETARY AND CONFIDENTIAL INFORMATION <small>The information contained in the document has to be kept strictly confidential. Any unauthorized use, reproduction, distribution or disclosure to third parties is strictly forbidden. ABB reserves all rights regarding intellectual Property Rights. Copyright 2018 ABB. All rights reserved</small>	FOR ADDITIONAL INFO REFER TO	SIGNATURES	DATE	 LEGEND, OPERATION, AND ACCESSORIES			
	APPLIED PRACTICES	MODEL GG	04/28/03			TITLE FIRST MADE FOR: ZTSD40-4000AMP SIZE CAGE CODE DWG NO 71A-0900D	
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DETAIL					
THIRD ANGLE PROJECTION	TOLERANCES ON:	CHECKED		SCALE: NA SHEET 2 OF 2			
	2 PL. DECIMALS ± .020	ENGRG FS					
	3 PL. DECIMALS ± .005	MFG					
	ANGLES ± 1°	QUALITY					
	FRACTIONS ± 1/64	ISSUED					
	FINISH <input checked="" type="checkbox"/>	DRAWING FILE: 71a-0900d.dwg					
		MODEL / ASSEMBLY FILE: ZTSD40-4000AMP					
	AutoCad Generated	# CTQs	\ominus CRITICAL TO QUALITY CHARACTERISTIC				

