



Quick Start Guide TS 910



- HAZARD OF ELECTRICAL SHOCK, EXPLOSION, OR ARC FLASH
- Read and understand this quick start guide before installing and operating the transfer switch
 - The installer is responsible for compliance with national electrical code requirements with respect to installation of this equipment.
 - Many components of this equipment operate at line voltage. DO NOT TOUCH. Use only electrically isolated tools.
 - Install and close all covers before applying power to this equipment
 - Do not open covers to equipment until ALL power sources are disconnected
 - This equipment must be installed and serviced only by qualified electrical personnel utilizing safe work practices and appropriate Personal Protective Equipment (PPE).
- Failure to do so may cause personal injury or death

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A. Introduction

Thank you for purchasing a Thomson Power Systems product. This quick start guide only applies to TS 910 series of Thomson Power Systems Transfer Switch models. For other product types please contact Thomson Power Systems.

This quick start guide contains all the information you need to install and set up your new Thomson Power Systems TS 910 Transfer Switch.

To conserve our natural resources, your transfer switch does not include a printed owner's manual. An owner's manual containing complete information about operating all of your new transfer switch features is available at our Web site. Go to www.thomsontechnology.com and download TS 910 Owners manual. **NOTE:** All information contained in this quick start guide is for reference only and is subject to change without notice.

B. Check Equipment Delivery

Upon delivery of the transfer switch, remove the product packaging and verify the product has not been damaged.



WARNING: Damaged Transfer Switch equipment: Do not install or operate the transfer switch if it appears damaged. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Check that the model number printed on the inside cover of the transfer switch is the same as on the delivery note corresponding to the purchase order.

C. Check Line Voltage/Amperage

The transfer Switch is designed for a maximum voltage of 120/240V, Single Phase 3 wire with neutral or Three Phase 4 wire with neutral. Verify the line voltage and amperage of the transfer switch matches the site requirements. **Note:** The transfer switch can be configured for operation on 220V or 208V sources by way of configuration jumper. Refer to section H of this guide for further information.



WARNING: Do not install the transfer switch if either voltage or amperage does not match. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

D. Installation Requirements

Before installing the transfer switch, review the following requirements:

- **Installation Codes/Permits and ATS Sizing:** Suitable permits are typically required by local jurisdictions having authority prior to installing standby generator sets and automatic transfer switches. Per NEC Article 702, Automatic transfer switches shall be sized for either a) entire load whole house, load calculation per NEC 220, or b) Pre-selected "EM" panel(s) of load being served or optional standby panel and transfer switch, or c) automatic load shedding feature to reduce total load imposed on the generator, not to exceed the capacity of the generator. The TS 910 transfer switch has automatic load shedding capabilities built-in when load shedding control contact is connected. Refer to Load Shedding section of this guide for further details.
- **Installation Location:** The standard TS 910 transfer switch is designed for indoor wall mounting. For applications requiring outdoor wall mounting, a NEMA 3R door kit is optionally available. The transfer switch must be installed in an environment where the temperature range is within +5° to +122° Fahrenheit (-15° to +50° Celsius) and humidity range not exceeding 5%-95% non-condensing.
- **Power Cabling:** All power cabling entering/exiting the enclosure must be installed in suitably sized conduit per NEC requirements. Ampacity, type and voltage rating of current carrying conductors must also comply with NEC requirements and local jurisdictions having authority.
- **Control Wiring:** All control wiring for engine start, load shed, alarm and remote test must be installed in separate conduits from all power cabling and must utilize suitably sized conduits per NEC requirements. All control wiring shall be sized for minimum #14 AWG. Control wiring type and voltage rating must also comply with NEC requirements and local jurisdictions having authority.
- **Generator Set Automatic Operation:** The TS 910 transfer switch operates in conjunction with any generator set with remote automatic starting capabilities utilizing a 2 wire, remote start control contact input. A dry contact is provided for remote generator starting control (contact closes to start generator and opens to stop generator). Refer to Automatic Sequence of Operation section of this guide for further details.
- **Upstream Overcurrent Protection (Non-Service Entrance Rated TS 910):** Non-Service Entrance Rated TS 910 transfer switch models do not contain any integral over current protection and require upstream over current protection devices for both Utility and Generator sources. The standard TS 910 is suitable for control of motors, electric discharge lamps, tungsten filament lamps, and electric heating equipment where the sum of motor full-load ampere ratings and the ampere ratings of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of the switch rating.
- **Upstream Overcurrent Protection (Service Entrance Rated TS 910):** Service Entrance rated TS 910 transfer switch models contain integral over current protection for the Utility source as standard. Service Entrance rated TS 910 transfer switches do not contain any integral over current protection for the generator source and requires upstream generator source over current protection. The Service Entrance rated TS 910 is rated for 80% maximum continuous loading of all load types.

Installation Requirements (cont'd)

- **Withstand/Interrupting Current Ratings:** Refer to electrical ratings table #1 shown below for withstand/Interrupting current ratings. Refer to Owner's Manual for a complete listing of upstream circuit breakers types/models which are required to be used upstream of the TS 910 transfer switch. Short circuit currents listed for Standard type ATS are Withstand ratings. Short circuit currents listed for Service Entrance type ATS are Interrupting ratings based on the ratings of the supplied utility service disconnect circuit breaker utilized.

WARNING: Do not install the transfer switch on systems with higher available short circuit current levels than listed in Table #1. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Table #1 Electrical Ratings

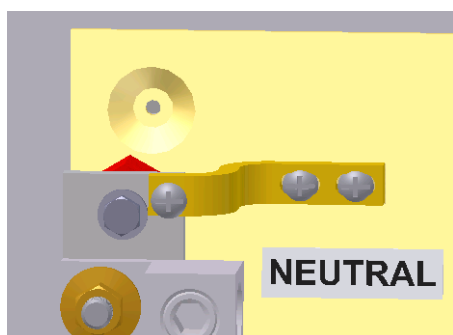
MODEL	ATS TYPE	POLES	MAX VOLTAGE	AMPERAGE	SHORT CIRCUIT CURRENT ¹
TS912A0100A	STANDARD	2	240V	100A	10kA
TS912A0100B	SERVICE ENTRANCE	2	240V	100A	10kA
TS912A0200A	STANDARD	2	240V	200A	10kA
TS912A0200B	SERVICE ENTRANCE	2	240V	200A	10kA
TS912A0400A	STANDARD	2	240V	400A	25kA
TS912A0400B	SERVICE ENTRANCE	2	240V	400A	25kA
TS913A0100A	STANDARD	3	240V	100A	22kA
TS913A0100B	SERVICE ENTRANCE	3	240V	100A	10kA
TS913A0200A	STANDARD	3	240V	200A	25kA
TS913A0200B	SERVICE ENTRANCE	3	240V	200A	10kA
TS913A0400A	STANDARD	3	240V	400A	50kA
TS913A0400B	SERVICE ENTRANCE	3	240V	400A	25kA

¹ AMPS RMS Symmetrical

- **Service Disconnect ATS configuration:** If the transfer switch is ordered with Service Entrance rating type and is to be used as Service Equipment, following the procedure described below:

WARNING: The transfer switch must be de-energized prior to opening the enclosure to access Neutral Bonding strap. **Failure to follow these instructions can result in death or serious injury.**

2. Connect the Bonding Strap to Neutral

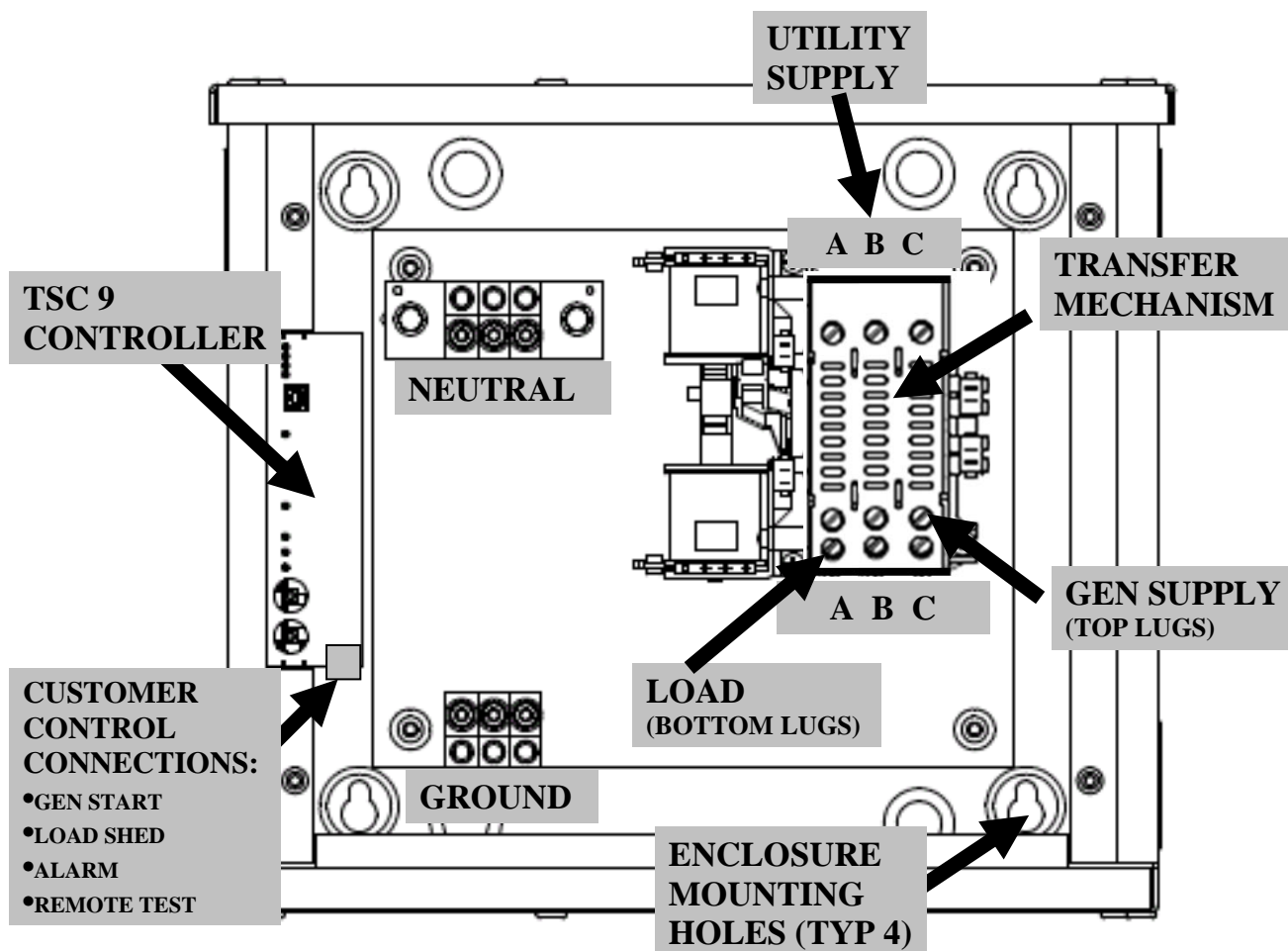


1. Apply the Service Disconnect label supplied with the ATS to the front of the door under the circuit breaker toggle



E. Typical Interior Component Layout Drawing

3 Pole Model Shown (2 Pole Model has 3rd Pole (Phase C) Removed)



F. Power Conductor Installation

The transfer switch is provided with power cable lugs for line, load and neutral block as per sizes indicated in Table #2 below. All Power cables are to be installed and torqued on the lugs per values indicated on Table #2.



WARNING: Failure to properly install and adequately tighten power cable connections can result in equipment malfunction and/or damage.

TABLE #2

Model	Amp	Contactor		Neutral		Ground	
		Cable	Lug	Cable	Lug	Cable	Lug
TS912A0100A	100A	#14 - 1/0	50in*lbs	#14 - 2/0	50in*lbs	#14 - 2/0	50in*lbs
TS912A0100B	100A	#14 - 1/0	50in*lbs	#14 - 2/0	50in*lbs	#14 - 2/0	50in*lbs
TS912A0200A	200A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS912A0200B	200A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS912A0400A	400A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS912A0400B	400A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS913A0100A	100A	#14 - 1/0	50in*lbs	#14 - 2/0	50in*lbs	#14 - 2/0	50in*lbs
TS913A0100B	100A	#14 - 1/0	50in*lbs	#14 - 2/0	50in*lbs	#14 - 2/0	50in*lbs
TS913A0200A	200A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS913A0200B	200A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS913A0400A	400A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs
TS913A0400B	400A	#6 - 250mcm	275in*lbs	#6 - 350mcm	275in*lbs	#14 - 2/0	50in*lbs



NOTE: Before megger testing is conducted, the Transfer Switch electronic controller (TSC 9) must be isolated from the power wiring by unplugging ATS wiring plug (J4). Refer to Photo show below. Failure to isolate the TSC 9 controller for megger testing can result in equipment malfunction and/or damage.



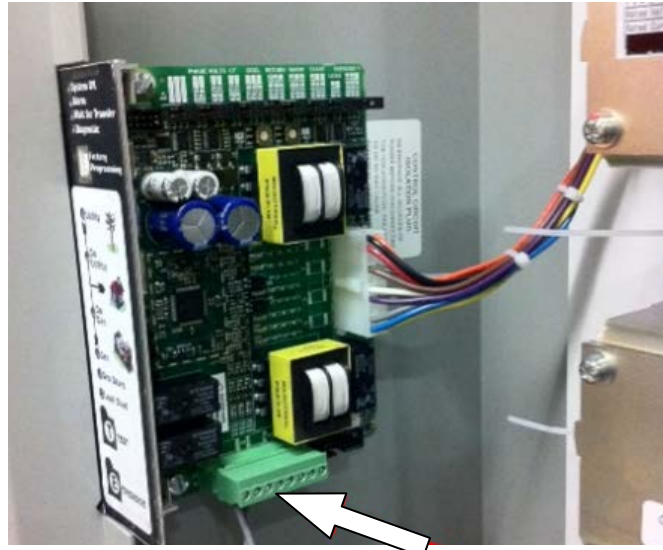
TSC 9 CONTROLLER ISOLATION WIRING PLUG

Following power cable installation, and isolating the TSC 9 controller, all power cables shall be appropriately megger tested to ensure no cross phase connections or conduction to ground.

Once megger testing is complete, re-insert the TSC 9 controller isolation plug (J4).

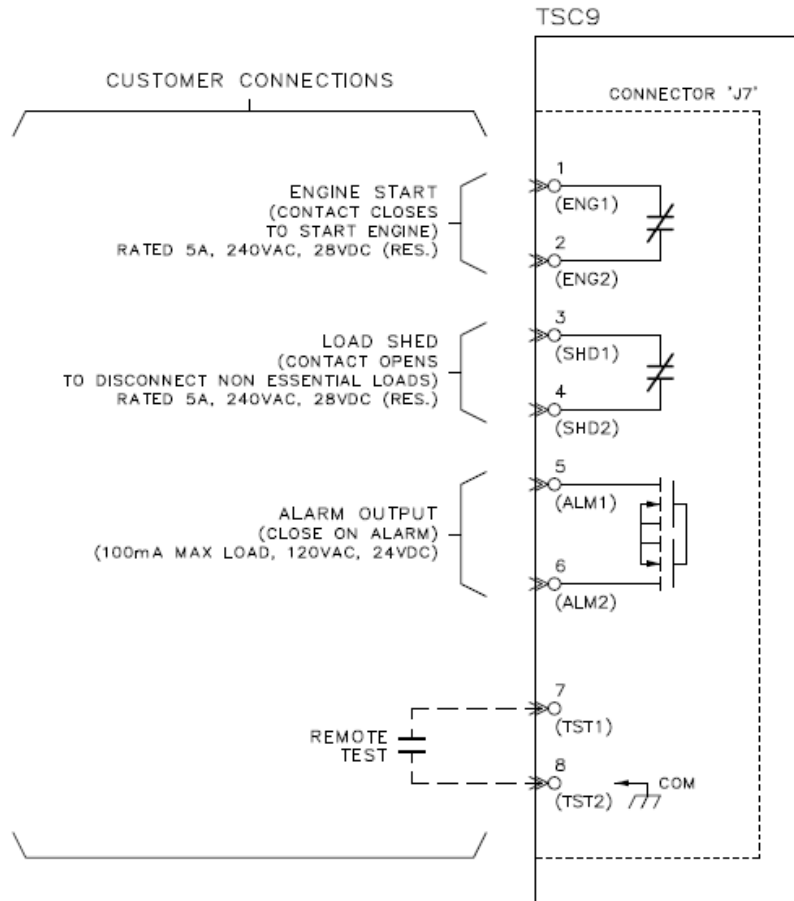
G. Control Wiring Connections

All control wiring connections are made directly on the TSC 9 Transfer controller. A removable plug-in clamp screw terminal block is provided at the bottom end of the controller (see photo below).




CONTROL TERMINAL BLOCK

Terminals are provided for the following control features: Refer to wiring diagram shown below for connection numbers.




H. TSC 9 Controller Configuration Jumpers

The following photo shows the location of user configurable jumpers on the TSC 9 controller. Factory default settings are shown in the table below.

 **WARNING:** The transfer switch must be de-energized prior to opening the enclosure to access the TSC 9 configuration jumpers. Do not change any configuration jumpers on the TSC 9 controller while the Transfer Switch is energized. **Failure to follow these instructions can result in death or serious injury.**

TSC 9 CONFIGURATION JUMPERS



TSC 9 CONFIGURATION JUMPERS		
FUNCTION	SETTING	FACTORY DEFAULT
EXERCISE TEST CYCLE	7 DAY	X
EXERCISE TEST CYCLE	14 DAY	
EXERCISE TEST CYCLE	28 DAY	
EXERCISE LOAD TRANSFER	ON LOAD	
EXERCISE LOAD TRANSFER	OFF LOAD	X
ENGINE START DELAY	3 SEC	X
ENGINE START DELAY	6 SEC	
ENGINE START DELAY	10 SEC	
ENGINE WARMUP TIME	10 SEC	X
ENGINE WARMUP TIME	30 SEC	
ENGINE WARMUP TIME	60 SEC	
UTILITY RETURN DELAY	10 SEC	
UTILITY RETURN DELAY	60 SEC	
UTILITY RETURN DELAY	120 SEC	X
ENGINE COOLDOWN TIME	1 MIN	
ENGINE COOLDOWN TIME	2 MIN	X
ENGINE COOLDOWN TIME	5 MIN	
CURRENT TRANSFORMER SIZE	200A	
CURRENT TRANSFORMER SIZE	400A	
SYSTEM VOLTAGE	208V	X (3PH only)
SYSTEM VOLTAGE	240V	X (1PH only)
SYSTEM PHASE	1 Ph	X (1PH only)
SYSTEM PHASE	3 Ph	X (3PH only)

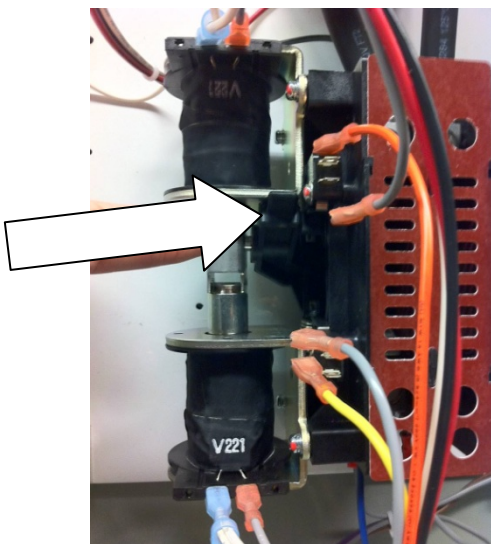


TSC 9 Printed Circuit Board Jumper Pin Layout

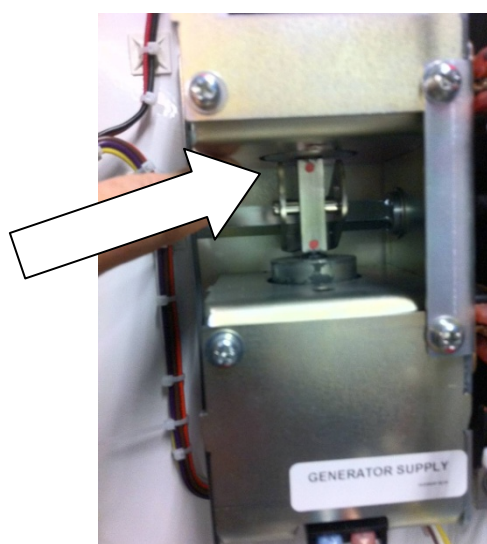
I. Equipment Energization Procedure

a. Pre-Energization Checks

1. Verify the generator and utility supply voltages are 120/240V single phase (or 120/208V 3 phase) maximum.
2. Confirm power cable size is correct for the lugs supplied in the transfer switch (line, load, and neutral) and are properly torqued.
3. Confirm transfer switch has been adequately grounded per NEC requirements.
4. Confirm power cables have been meggered to ensure no cross phase connections or conduction to ground.
5. Check for mechanical damage.
6. Check no packaging materials or tools are left inside the transfer switch.
7. Verify control wiring connected to the pluggable terminal block is properly installed (i.e. no frayed ends, screw are tight, no damage, etc).
8. Ensure TSC 9 Control Isolation Plug (J4) is inserted into the TSC 9 Controller prior to operation.
9. Verify TSC 9 controller jumpers are set to reflect desired operation.
10. Visually verify the transfer switch power contactor is closed in the utility position. The upper solenoid plungers will be pulled towards the upper coils (refer to photos below).



100A/200A Contactor Utility Position



400A Contactor Utility Position

11. Verify correct control wire interconnects have been installed to the generator set auto start/stop controls. **Note:** The ATS Engine Start contact CLOSES to start the engine and OPENS to stop the engine.
12. Ensure the inside of the transfer switch is clean from all dust, and other foreign materials.
13. Re-install enclosure door front cover and tighten all cover mounting screws.
14. Visually verify on the transfer switch enclosure that there are no gaps, holes, or potential for water ingress.

b. Equipment Energization



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- Many components of this equipment operate at line voltage. DO NOT TOUCH. Use only electrically isolated tools.

Failure to do so may cause personal injury or death

1. Confirm Utility, Generator and loads can be energized in a safe manner.
2. Energize utility supply and confirm voltage is 120/240V single phase (or 120/208V 3 phase) and phasing is correct at the source.
3. Verify the status of the following indicator lights on the TSC 9 HMI faceplate:
 - Utility Source Green light is "ON"
 - Load on Utility Green light is "ON"
4. Run the generator manually and confirm generator supply voltage is 120/240V single phase (or 120/208V 3 phase) and phasing is correct at the source.
5. Verify the status of the following indicator lights on the TSC 9 HMI faceplate:
 - Generator Source Red Light is "ON"
6. Using appropriate personal protective equipment (PPE) and insulated tools/meters, remove the transfer switch front cover while energized.
7. Verify at the transfer switch (while energized), the utility and generator supply voltage, phasing and phase rotation is correct.
8. Manually stop generator and place the generator controls in the "AUTOMATIC" position.
9. To confirm automatic starting and load transferring of the generator, perform the following steps:
 - a) To test, press and hold the "T" pushbutton on the TSC 9 controller faceplate for **2 seconds** until light above pushbutton comes ON. The generator will start and transfer on load per Automatic Sequence.
 - b) To determine correct operation, observe the following on the TSC 9 faceplate:
 - Gen Start Red light is "ON"
 - Gen Source Red light is "ON"
 - Load on Gen Red light is "ON"
10. To stop the generator and transfer load back to the utility supply, press and hold the "T" pushbutton for **2 seconds** until light above pushbutton goes OFF. The load will re-transfer back to the utility power as per Automatic Sequence.
11. Perform a utility power outage test by opening the upstream utility feeder breaker. The TSC 9 controller Utility supply light will turn off; the generator set will start after the 3-second engine start delay has expired, the generator should start and transfer on load as per Automatic Sequence.
12. Return the transfer switch to utility power by re-closing the upstream utility breaker. The load should re-transfer back to the utility supply as per Automatic Sequence.




J. Transfer Switch Operation

a. Automatic Sequence of Operation

Note: Time delays indicated below are factory default settings only. Refer to Owners manual for alternate time delay settings available on TSC 9 Controller

UTILITY POWER FAIL	When voltage drops on any phase of the utility supply below 70% of rated voltage, a generator start sequence will be initiated
GEN START	The generator will start following expiry of the 3 second Gen Start timer
GEN WARM-UP	A generator warm-up period will be initiated once the generator starts and reaches 80% rated voltage and 90% rated frequency
TRANSFER TO GEN	The load will transfer to the generator supply following expiry of the 10 second Gen Warm-up timer
LOAD SHED ACTIVATE	All non-essential loads connected to Load Shed control circuit will be de-energized once the generator transfers on load provided the Load Shed feature has been enabled. Refer to Owners manual for further details.
UTILITY POWER RETURN	When utility power is restored to above 80% rated voltage on all phases, a utility return timer sequence will be initiated
TRANSFER TO UTILITY	The load will transfer from generator to utility power following expiry of the 120 second utility return timer provided both generator and utility voltages are in-phase at time of transfer.
LOAD SHED RESET	All non-essential loads connected to Load Shed control circuit will be re-energized once load transfers to utility power.
GEN COOLDOWN	The generator will automatically stop following expiry of the 2 minute cool down timer.

b. TSC 9 Controller Operation Pushbuttons

TEST 	<p>To Load Test, press and hold the “T” pushbutton for 2 seconds until LED light above pushbutton comes ON. The generator will start and transfer on load per Automatic Sequence.</p> <p>To cancel Load Test, press and hold the “T” pushbutton for 2 seconds until LED light above pushbutton goes OFF. The load will re-transfer back to the utility power per Automatic Sequence.</p>
EXERCISE 	<p>To set Exercise mode and schedule, press and hold the “E” pushbutton for 2 seconds until LED light above pushbutton starts flashing. The generator will start and operate off load (or ON Load if selected). The generator will operate for 30 minutes then will automatically stop. Exercise LED will change from flashing to continuously ON, indicating exercise clock schedule is enabled. The generator will automatically start and exercise in 7, 14 or 28 day cycles as selected.</p> <p>To cancel Exercise, press and hold the “E” pushbutton for 2 seconds until LED light above pushbutton goes OFF.</p>
TIMER BYPASS LAMP TEST ALARM RESET 	<p>TIMER BYPASS: Press and hold the “E” and “T” pushbutton together for 2 seconds to bypass any active time delay.</p> <p>LAMP TEST: Press and hold the “E” and “T” pushbutton together for 5 seconds to activate lamp test function.</p> <p>ALARM RESET: Press and hold the “E” and “T” pushbutton together for 10 seconds until alarm LED goes out.</p>

c. ATS Manual Operation

The transfer switch maybe operated manually for maintenance or emergency operation conditions provided both Utility and Generator supplies are de-energized prior to manual operation.



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- Many components of this equipment operate at line voltage. DO NOT TOUCH. Use only electrically isolated tools.
- Install and close all covers before applying power to this equipment
- Do not open covers to equipment until ALL power sources are disconnected

Failure to do so may cause personal injury or death

Once both Utility and Generator supplies are de-energized the following procedure can be used to operate the Transfer Switch manually.

1. Up-plug the TSC 9 controller isolation plug (J4) to prevent automatic operation.
2. Open ATS enclosure and locate Manual Operation Handle provided with the transfer switch (see photos below)

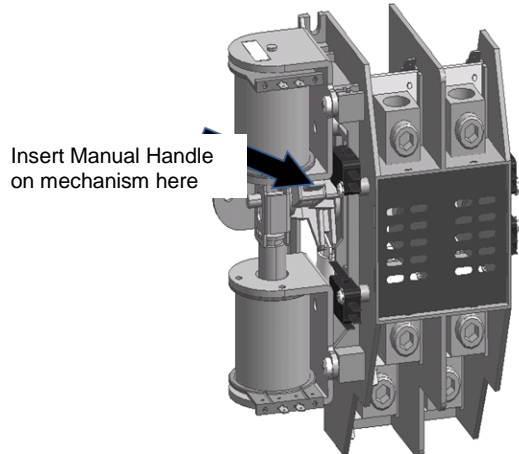


100A/200A ATS Handle

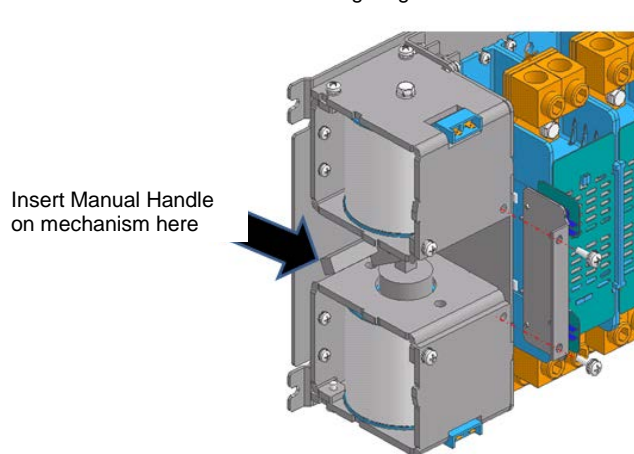


400A ATS Handle

3. Insert manual handles onto the transfer switch mechanism at locations shown in the following diagrams.



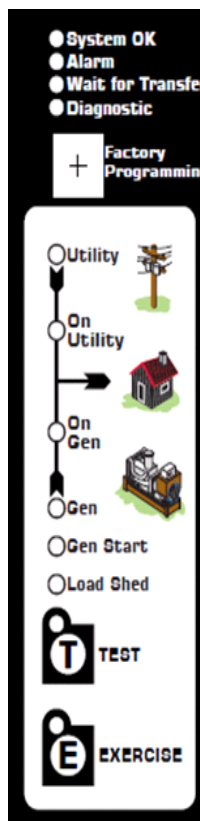
100A/200A Contactor Mechanism (2 pole)



400A Contactor Mechanism (2 pole)

4. To manually operate mechanism to the utility supply position, rotate handle upwards. Do not over-torque handle once position has been attained.
5. To manually operate mechanism to the generator supply position, rotate handle downwards. Do not over-torque handle once position has been attained.
6. Once ATS is manually operated to desired position, re-install enclosure cover, then re-energize supply sources to re-energized the load.

K. TSC 9 Indication Lights and Pushbuttons



	Light Color	Label	Light Off	Light On	Light Slow Flash	Light Fast Flash
	Green	System OK			System is functioning normally.	
	Yellow	Alarm	No fault condition has occurred since last system reset.	A fault condition has occurred since last system reset.		
	Yellow	Wait For Transfer	Not currently waiting for in-phase transfer.	Currently waiting for in-phase transfer.		A in-phase transfer related fault has occurred.
	Green	Diagnostic	Unused. Always off.			
	Green	Utility	Utility voltage/freq not good.	Utility voltage/freq good.		
	Green	On Utility	Load is not on utility.	Load is on utility.		A utility-related transfer fault has occurred.
	Red	On Generator	Load is not on generator.	Load is on generator.		A gen-related transfer fault has occurred.
	Red	Generator	Gen voltage/freq not good.	Gen voltage/freq good.		
	Red	Generator Start	Generator is not commanded to start/run.	Generator is commanded to start/run.		
	Yellow	Load Shed	Load is not being shed.	Load is being shed.		
	Yellow	TEST	Manual test is not active.	Manual test is currently active.	Manual test is active, initiated remotely.	
	Yellow	EXERCISE	Exercise is not active or enabled	Exercise is enabled but not currently active.	Exercise is currently active.	An exercise related fault has occurred.
Special Conditions						
		Lamp Test	All indicators flash fast together.			
		System Reset	Test and Exercise lights flash fast alternatively. All other indicators are off.			

L. Load Shed

Load Shed Feature	Application	Feature Description	TSC 9 CT Jumper Position	TSC 9 kW Settings
Disabled (factory default)	Load Shed feature not used for applications using Genset & ATS which are sized for whole house load	Load Shed Relay & Status LED Indicator are disabled	None	00
Basic	Basic load shed feature used when Genset is sized for only partial home load and requires automatic control to shed selected non-essential load. Feature activated when TSC 9 kW setting is >00 setting	<ul style="list-style-type: none"> - Load Shed Relay & Status LED Indicator are enabled on TSC 9 controller - Load Shed Relay & LED are activated whenever Generator is On Load and resets when load returns to utility power - Normally Closed contact opens during Load shed condition to open control circuit of connected non-essential load 	None	>00 Setting
kW Load Management (feature sold separately-refer to associated instructions for further details)	kW Load Management Load shed used when Genset is sized for only partial home load and requires automatic control to shed selected non-essential load. Feature provides added benefit of maximizing available generator capacity where home loads vary over time. Requires additional Current Transformers	<ul style="list-style-type: none"> - Load Shed Relay & Status LED Indicator are enabled on TSC 9 Controller - Load Shed Relay & LED are controlled via CT input signal (refer to kW load Management sequence of operation) - Normally Closed contact opens during Load shed condition to open control circuit of connected non-essential load 	200A or 400A CT Position (100A Model uses 200A CT)	>00 Setting to be 95% of Gen kW rating

M. Schematic Diagram

