THOMSON TECHNOLOGY
POWER & CONTROL
A REGAL-BELOIT COMPANY

TS 830

AUTOMATIC TRANSFER SWITCHES

INSTALLATION, OPERATING & SERVICE MANUAL

PM059 REV 4 07/03/26

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1. PRODUCT REVISION HISTORY

The following information provides an historical summary of changes made to this product since the original release.

Operating & Service Manual Version

Rev 4 07/03/26	Revision to add MEC 310 controller
Rev 3 04/12/21	Revisions to incorporate the new model coding.
Rev 2 04/03/10	Revisions to mechanism style 1000A, 1200A & 1600A.
Rev 1 03/04/15	Revisions to text, dimensions, & cable specifications.
Rev 0 02/12/20	Original release.

Contact Thomson Technology, to obtain applicable instruction manuals or if in doubt about any matter relating to installation, operation or maintenance. Soft copy of the most current version is available at www.thomsontechnology.com.

NOTE: All information contained in this manual is for reference only and is subject to change without notice.

2. EQUIPMENT STORAGE

The following procedures are required for correct storage of the transfer switch prior to installation.

> ***CAUTION!!!***
>
> Failure to store equipment as specified may cause damage and void warranty**.**

- Before storing, unpack sufficiently to check for concealed damage. If concealed damage is found, notify Thomson Technology and the Carrier immediately.
- Repack with the original, or equivalent packing materials. Protect from physical damage. Do not stack.
- Store indoor in a clean, dry, well-ventilated area free of corrosive agents including fumes, salt and concrete/cement dust. Apply heat as necessary to prevent condensation.
- The following storage temperature and humidity must be maintained: -20 to +70°Celsius, 95% Humidity non-condensing.

3. NOTES TO INSTALLER

Before opening the transfer switch enclosure to perform any service task, or to manually transfer the mechanism, it is imperative to isolate the transfer switch from any possible source of power. Failure to do so may result in serious personal injury or death due to electrical shock.

> ***CAUTION!!!***
>
> ***All installation and/or service work performed must be done by qualified personnel only. Failure to do so may cause personal injury or death.***

3.1. *ELECTRICAL CONNECTIONS*

To ensure satisfactory installation of this equipment be sure to observe "Cable Terminal Information" regarding power cable connection tightness located in this manual.

All mechanical and electrical connections must be checked for tightness prior to placing this equipment in service to ensure proper operation and to validate applicable warranty coverage.

3.2. *TRANSFER SWITCHES WITH ADJUSTABLE OVER CURRENT PROTECTION*

Standard models of automatic transfer switches incorporate integral over current protection. Transfer switches rated 1000A or higher are supplied with adjustable over current protection trip units. For models of transfer switch with integral over current protection, the over current protection must be set prior to operation. The equipment will be shipped from the factory with a long-time current setting of 100% (of the equipment rating) and maximum short-time/instantaneous current and time delay settings.

> **WARNING!**
>
> ***Do Not Energize this equipment until device settings have been verified to ensure proper system protection & coordination. Failure to do so may result in equipment failure.***

Refer to ***Section 5.1.3*** of this manual for additional information on operation of the Transfer switch following an over current trip condition.

Refer to information supplied with the transfer switch documentation package for adjustment procedures on the power switching units over current protection trip unit. Contact the factory if any additional information is required.

3.3. *TRANSFER SWITCHES WITH MULTI-TAP VOLTAGE CAPABILITY*

If the transfer switch has programmable multi-tap voltage capability confirm the transfer switch has been configured for the correct system voltage prior to installation.

WARNING!

Failure to confirm and match transfer switch voltage with the system voltage could cause serious equipment damage.

The voltage selections and connections are shown on the engineered drawings attached to each transfer switch. The factory default settings will be indicated on the calibration label attached on the inside of the enclosure door (supplied loose on open style models). A blank label is included to record the applicable settings if the configuration is changed from the factory default settings.

To change the transfer switch configuration the following must be accomplished:

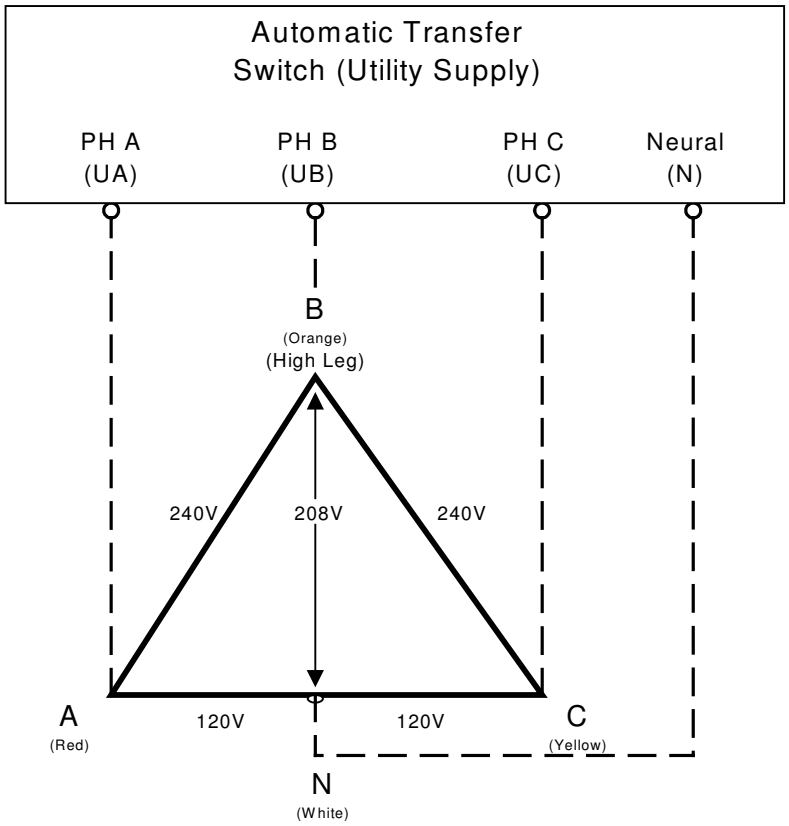
- Change voltage taps on potential transformers (PT's) to correct system voltage (refer to drawings)
- Change program setting in the applicable controller used on the transfer switch (e.g. TSC 80, TSC 800, MEC 2, MEC 20, MEC 310) for nominal system voltage. Refer to *the applicable controller* instruction manual for further information.
- Once the PT voltage taps and controller has been re-programmed to correct operating voltage, the "control circuit isolation plug" on the mechanism, may be reconnected, prior to voltage energization.

3.4. *SYSTEM PHASING-HIGH LEG DELTA SYSTEMS*

For systems using high leg delta 240V 3 phase 4 wire systems, connection of supply conductors must have the correct phasing as shown below.

WARNING!

Failure to match correct system phasing will result in serious damage to the controller.



CAUTION!!!

All installation and/or service work performed must be done by qualified personnel only. Failure to do so may cause personal injury or death.

Where transfer switches are supplied without power isolation transformers (PT1 & PT2) for ATS control logic it is essential that the orientation of phase conductors of the supply source be arranged such that the phase of highest potential with respect to ground is not connected to the power supply inputs to the controller (The A Phase for both supplies). Failure to do so will result in equipment damage.
Per NEC Article 384-3 (f) "The B phase shall be that phase having the higher voltage to ground on a 3-phase, 4-wire delta connected systems."

3.5. *REMOTE START CONTACT FIELD WIRING*

For applications using TSC 80, 800 controllers, as a minimum, the remote engine start control field wiring shall conform to the local regulatory authority on electrical installations. Field wiring of a remote start contact from a transfer switch to a control

panel should conform to the following guidelines to avoid possible controller malfunction and/or damage.

3.5.1. Minimum #14 AWG (2.5mm^2) wire size shall be used for distances up to 500ft (150m)[1]). For distances exceeding 500 ft. (150m) consult Thomson Technology.

3.5.2. Remote start contact wires should be run in a separate conduit.

3.5.3. Avoid wiring near AC power cables to prevent pick-up of induced voltages.

3.5.4. An interposing relay may be required if field-wiring distance is excessively long (i.e. greater than 500 feet (150m) and/or if a remote contact has a resistance of greater than 5.0 ohms.

3.5.5. The remote start contact must be voltage free (i.e. dry contact). The use of a "powered" contact will damage the transfer controller.

3.6. *DIELECTRIC TESTING*

Do not perform any high voltage dielectric testing on the transfer switch with the controller connected into the circuit, as serious damage will occur to the controller. All AC control fuses and/or control circuit breakers or control circuit isolation plugs connected to the controller must be removed if high voltage dielectric testing is performed on the transfer switch.

3.7. *INSTALLATION OF OPEN TYPE TRANSFER SWITCHES*

Please contact Thomson Technology for additional information.

4. GENERAL DESCRIPTION

Thomson Technology TS 830 series of Automatic Transfer Switches employ two mechanically interlocked enclosed contact power switching units and a microprocessor based controller to automatically transfer system load to a generator supply in the event of a utility supply failure. System load is then automatically re-transferred back to the utility supply following restoration of the utility power source to within normal operating limits. Transfer switches with MEC 2, MEC 20 or MEC 310 controllers installed have integral engine-genset auto start control & monitoring features and therefore these applications do not require an engine-mounted auto start control panel.

The standard TS 830 series Automatic Transfer Switch is rated for 100% system load and does not require upstream over current protection. Refer to ***Section 6*** of this manual for detailed information on over current protection.

The TS 830 series transfer switch may be supplied with type TSC 80, TSC 800, MEC 310 or MEC 20 controllers as specified at equipment order. All controllers are microprocessor based which provides all necessary control functions for fully automatic operation. The controllers are mounted on the door of the transfer switch enclosure and operating status is shown via LED lights and/or LCD display dependent upon controller type. For further information on the controller utilized, refer to separate instruction manuals.

The power switching devices used for the Utility and Generator sources are operated by an electrically driven motor mechanism in the transfer switch. The transfer switch motor utilizes the power from the source to which the electrical load is being transferred. The mechanism provides a positive mechanical interlock to prevent both power switching units from being closed at the same time, which allows an interrupted “break-before-make” transfer sequence.

Note: For the purpose of this manual, the following standard nomenclature is utilized:

- Utility: to indicate the source of primary power
- Generator: to indicate the source of standby power
- Power switching device: to indicate the transfer switch power switching device

4.1. *PRODUCT MODEL CODE*

The type of TS 830 series transfer switch supplied is identified by way of a 21 digit product code which appears on the equipment rating plate (MODEL) on the door of the transfer switch, and on the transfer switch drawings. The model code structure and definitions are as follows:

1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
T	S	8	3																

1-3. SERIES
TS – TRANSFER SWITCH

4 & 5. MODEL
83 – 830 SWITCH

6. POLES
2 – 2 POLE
3 – 3 POLE
4 – 4 POLE

7. CONFIGURATION TYPE
A – ATS
X – SPECIAL

8-11. AMPERAGE
0063
0100
0160
0250
0400
0630
0800
1000
1200
1600

12. APPLICATION
A – STANDARD
C – DUAL SOURCE
X – SPECIAL

13. OPERATION TYPE
1 – OPEN TRANSITION
2 – MANUAL ELEC. OP.
X – SPECIAL

14. CERTIFICATION
X – NOT APPLICABLE

15. VOLTAGE
1Ø 3 WIRE
D – 120/240

3Ø 4 WIRE (GROUNDED NEUTRAL)
(*=MULTI-VOLTAGE CAPABLE)
E – 120/208*
F – 127/220
G – 120/240*(DELTA)
H – 220/380**
J – 240/415

3Ø 3 WIRE
P – 208
Q – 220
R – 240
S – 380**
U – 415

X – SPECIAL
** FOR 50HZ APPLICATION

16. CONTROLLER
1 – TSC 80
2 – TSC 800
3 – TSC 8000
4 – MEC 2 (PCC)
5 – MEC 20 (PCC)
6 – PGC 4000
7 – NONE
8 - MEC 310

17. ENCLOSURE TYPE
A – NEMA 1, BEIGE
B – NEMA 2, BEIGE
C – NEMA 12, BEIGE
D – NEMA 3R SD, BEIGE
E – NEMA 3R DD, BEIGE
F – NEMA 4X, STAINLESS STEEL
G – NONE (OPEN STYLE)
X – SPECIAL

18. UTILITY SWITCHING DEVICE
M – MOLDED CASE SWITCH C/W THER-MAG TRIP

19. GENERATOR SWITCHING DEVICE
M – MOLDED CASE SWITCH C/W THER-MAG TRIP

20. POWER CONNECTIONS
A – STANDARD
X – SPECIAL

21. CONNECTION CONFIGURATION
(SEE DRAWING M-007450-00051)
A – STANDARD
B – ALTERNATE B (400-1600A)
C – ALTERNATE C (400-1600A)
D – ALTERNATE D (400-1600A)
X – SPECIAL

5. GENERAL THEORY OF OPERATION

5.1. *STANDARD AUTOMATIC TRANSFER SWITCH*

5.1.1. NORMAL OPERATION

When utility supply voltage drops below a preset nominal value (adjustable from 70% to 100% of nominal) on any phase, an engine start delay circuit will be initiated and the transfer to utility supply signal will be removed (i.e. contact opening). Following expiry of the engine start delay period (adjustable from 0 to 60 sec.) an engine start signal (contact closure) will be given.

Once the engine starts, the transfer switch controller will monitor the generator voltage and frequency levels. Once the generator voltage and frequency rises above

preset values (adjustable from 70% to 95% of nominal), the engine warmup timer will be initiated. Once the warmup timer expires (adjustable from 0 to 60 sec.), the Transfer to Generator Supply signal (contact closure) will be given to the transfer switch mechanism. The load will then transfer from the utility supply to the generator supply via the motor driven mechanism.

The generator will continue to supply the load until the utility supply has returned. The retransfer sequence is completed as follows: when the utility supply voltage is restored to above the preset values (adjustable from 70% to 95% of nominal) on all phases, a transfer return delay circuit will be initiated. Following expiry of the Utility Return Timer (adjustable from 0 to 30 min.), the Transfer to Generator Supply signal will be removed (contact opening), and then the Transfer to Utility Supply signal (contact closure) will be given to the transfer switch mechanism. The load will then retransfer the load from the generator supply back to the utility supply. **Note:** For transfer switches with TSC 80/800 controllers, a neutral delay timer circuit will delay the transfer sequence in the neutral position (i.e. both power switching devices open) until the neutral time delay period expires (adjustable from 0 to 60 sec.).

An engine cooldown timer circuit will be initiated once the load is transferred from the generator supply. Following expiry of the cooldown delay period (adjustable from 0 to 30 min.), the engine start signal will be removed (contact opening) to initiate stopping of the generator set. **Note:** For transfer switches with MEC 2/20, MEC 310 controllers, engine start signal is internal to the controller.

5.1.2. OVER CURRENT TRIP (TSC 80/TSC 800 CONTROLLERS)

Should the utility power switching device trip open due to an over current condition, TSC 80 or TSC 800 transfer controller will initiate an engine start signal and will permit transfer of the load to the generator supply. The utility source will be locked out and the load will remain on the generator supply until the TSC 80/TSC 800 alarm signal is manually reset.

Refer to the TSC 80 & TSC 800 Instruction Manuals for further details on Transfer Fail operation.

Should the generator power switching device trip open due to an over current condition, TSC 80/TSC 800 transfer controller will initiate transfer of the load to the utility supply. The generator source will be locked out and the load will remain on the utility supply until the TSC 80/TSC 800 alarm signal is manually reset.

5.1.3. OVER CURRENT TRIP (MEC 2/MEC 20/MEC 310 CONTROLLERS)

Should the utility power switching device trip open due to an overcurrent condition, the generator will not automatically start and transfer on load. The generator must be started and transferred on load manually.

Should the generator power switching device trip open due to an overcurrent condition, the generator will shutdown and the load will automatically return to the utility supply if its voltage is normal. **Note**: for automatic transfer to utility, the transfer switch must be factory ordered with a “gen breaker tripped” auxiliary contact inside the generator power switching device and must be wired to the gen set controllers shutdown alarm circuits.

Refer to the Gen Set controller instruction manual for further details on manual operation or shutdown-reset operation.

5.2. *TEST MODES*

The transfer switch may be tested utilizing the controller pushbuttons or optional test switch. A simulated utility power failure condition will be activated when the test mode is selected. The transfer switch will operate as per a normal utility power fail condition.

The transfer switch will remain on generator supply until the test mode is terminated. It will then immediately transfer back to the utility supply and then continue to operate the generator set for its cooldown period then stop. **Note:** The transfer switch will automatically return to the utility supply (if within nominal limits) if the generator set fails while in the test mode.

6. OVER CURRENT PROTECTION

Thomson Technology ***TS 830*** series of Automatic Transfer Switches are supplied standard with integral over current protection.

The type of over current protection utilized is dependent upon ATS amperage size and optional features specified. For transfer switches rated 100A through 800A, over current protection is non-adjustable thermal-magnetic type trip units. For transfer switches rated 1000A through 1600A over current protection is adjustable electronic type with long time & instantaneous trip unit elements with optional ground fault protection elements.

Note: For models of transfer switch with adjustable integral over current protection trip units, the over current protection must be set prior to operation. The equipment will be shipped from the factory with a long-time current setting of 100% (of the equipment rating) and maximum instantaneous/short-time/ground fault (if supplied) current and time delay settings.

WARNING!

Do Not Energize this equipment until device settings have been verified to ensure proper system protection & coordination. Failure to do so may result in equipment failure.

7. GENERAL NOTES ON SERVICING ATS MECHANISM

(See CAUTION! on Page #2)

When performing any service work on the transfer mechanism, it is imperative that the following be observed:

7.1. To maintain mechanical integrity, ensure that:

- All limit switches linkages are correctly adjusted to provide full travel of the power switching device toggles *without* exerting unnecessary forces associated with excessive travel. Ensure that power switching device travel far enough to reset any internal trip unit (it is more important for the toggle to go fully in the "off" direction, than in the "on" direction).
- Mechanical interlocking is correct when one power switching opens well before the other should close.
- All fasteners are adequately tightened.
- The operating linkages are not damaged or bent, and that all bearing points operate freely.

7.2. To maintain electrical integrity, ensure that:

- All electrical connections, especially power connections, are clean and adequately tightened. Corroded or loose power connections will cause destructive heating, and may cause premature tripping.
- All insulating devices are in place and in good condition.
- No moisture or other contamination is present.
- Electrical conductors are adequately secured away from moving parts.

7.3. To maintain operational integrity, ensure that:

- All control devices are in good condition and correctly calibrated.

- All control devices are adequately secured in their plug-in fixtures.

Only qualified personnel should undertake service work. Failure to correctly maintain an automatic transfer switch may present a hazard to life and equipment. Full operational testing must be done prior to placing a transfer switch in service subsequent to any maintenance or repair. Any service work involving electrical components requires high-potential testing to ensure that required insulation levels have been maintained.

8. TRANSFER SWITCH MECHANISM – 100 - 400 Amp

The transfer mechanism consists of the transfer motor and drive assembly, which operates a common yoke which in turn operates both utility and generator power switching devices. Since the power switching devices are oriented opposite to each other, the action of turning one power switching device off will result in turning the other power switching device on. The geometry of the mechanism ensures that one power switching device always opens before the other closes, thus maintaining the required mechanical interlocking.

The unidirectional motor, operating through the motor drive arm and rod assembly, which is normally held captive to the yoke via the manual release plunger assembly, acts upon the yoke drive arm. Both power-switching device toggles are set inside the common yoke and are moved by it. There are two limit switches that are contacted by the yoke at its extremes of travel, disconnecting the motor circuit at the point of full power switching device toggle travel in the intended direction. Should adjustment be required it is advisable to consult Thomson Technology for further information.

The transfer switch mechanism has three possible positions:

a) Utility power switching device closed and generator power switching device open;
b) Generator power switching device closed and utility power switching device open;
c) Both utility and generator power switching devices open, but NEVER both utility and generator power switching devices closed at the same time.

8.1. *MANUAL OPERATION*

(See CAUTION! on Page #2)

Isolate the transfer switch from all sources of supply before opening the enclosure for manual operation. With all sources of power de-energized to the transfer switch, the control circuit isolation plug (PL12) can be unplugged to prevent subsequent operation.

To operate manually, pull the manual release plunger, releasing the motor drive rod from the motor drive arm and push the yoke in the desired direction.

Automatic operation may be regained by replacing the isolation plug. With all sources of power de-energized to the transfer switch, the control circuit isolation plug (PL12) can be re-connected. The drive system is self-engaging and will operate the transfer switch to the required position. (See manual operation instruction on front of transfer switch mechanism.)

9. TRANSFER SWITCH MECHANISM – 600 - 1600 Amp

The transfer mechanism consists primarily of the transfer motor, a hub assembly, two operating rods and two power switching device operating yokes.

The reversible transfer motor drives the hub assembly, which in turn moves the operating rods that are connected to the power switching device operating yokes. The power switching device toggles are set inside the yokes and are moved by them. There are two limit switches, which are contacted by the operating yokes (one for each direction of travel), which disconnect the transfer motor power supply when the power switching devices have attained full travel. The adjuster screws located on the yoke determines the operating point of these limit switches. Should adjustment be required, it is advisable to consult Thomson Technology for further information.

The transfer switch mechanism has three possible positions:

a) Utility power switching device closed and generator power switching device open;
b) Generator power switching device closed and utility power switching device open;
c) Both utility and generator power switching devices open, but NEVER both utility and generator power switching devices closed at the same time.

9.1. *MANUAL OPERATION*

(See CAUTION! on Page #2)

Isolate the transfer switch from all sources of supply before opening the enclosure for manual operation. With all sources of power de-energized to the transfer switch, the control circuit isolation plug (PL12) can be unplugged to prevent subsequent operation.

To operate manually, pull the release plunger and operate the handle in the desired direction.

Automatic operation may be regained by replacing the isolation plug. With all sources of power de-energized to the transfer switch, the control circuit isolation plug (PL12) can be re-connected. The drive system is self-engaging and will operate the transfer switch to the required position. (See manual operation instruction on front of transfer switch mechanism.)

10. RECOMMENDED MAINTENANCE

(See CAUTION! on Page #2)

10.1. DO NOT perform dielectric tests on the equipment with the control components in the circuit.

10.2. Check if control components are tight in sockets.

10.3. Periodically inspect all terminals (load, line and control) for tightness. Re-torque all bolts, nuts and other hardware. Clean or replace any contact surfaces that are dirty, corroded or pitted.

10.4. Transfer switches should be in a clean, dry and moderately warm location. If signs of moisture are present, dry and clean transfer switch. If there is corrosion, try to clean it off. If cleaning is unsuitable, replace the corroded parts. Should dust and/or debris gather on the transfer switch, brush, vacuum, or wipe clean. DO NOT blow dirt into power switching devices.

10.5. Test the transfer switch operation. While the unit is exercising, check for freedom of movement, hidden dirt, corrosion or any excessive wear on the mechanical operating parts. Ensure that the power switching device travel is correct.

10.6. Verify all program settings on the controller as per the calibration label or programming sheets.

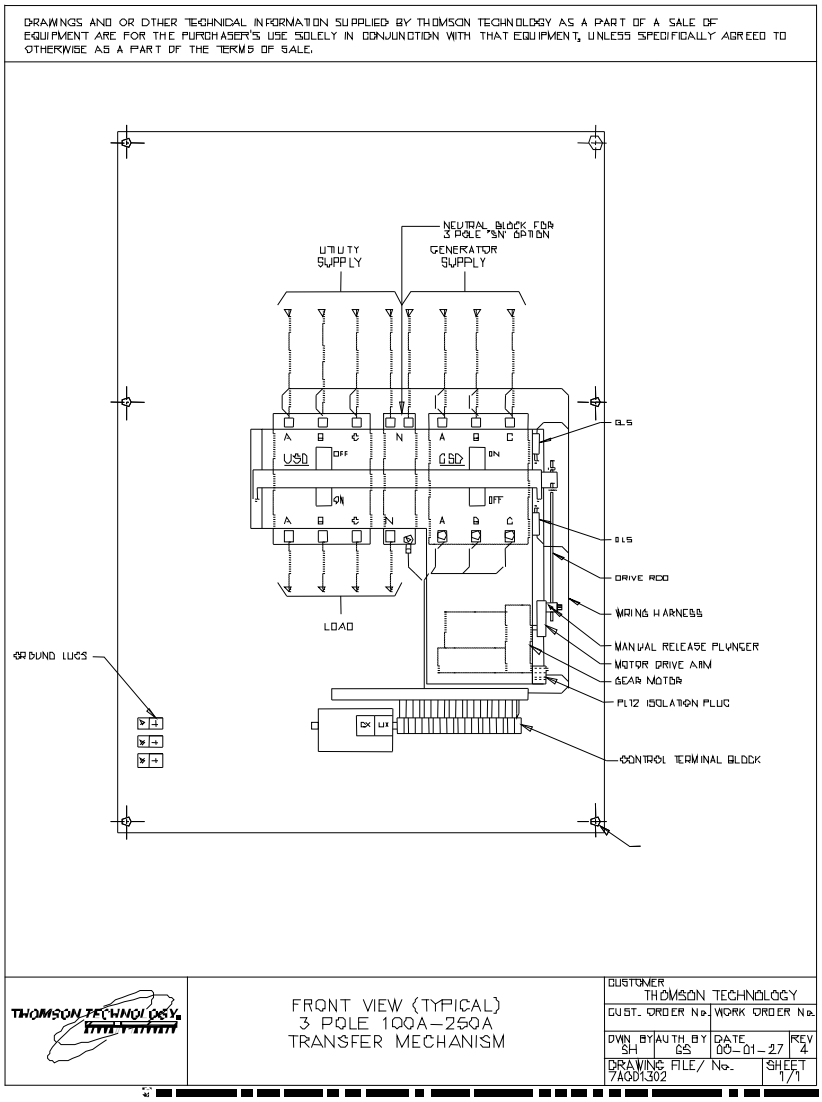
10.7. Transfer Mechanism 100-400A - confirm that the yoke operates freely on the yoke pivot bushings. Should lubrication be required, apply medium weight (SAE 20) oil sparingly at these points.

10.8. Transfer Mechanism 600A-1200A - ensure that the manual handle moves freely on the hub when the lock pin is disengaged. If lubrication is necessary, apply medium weight (SAE 20) oil sparingly.

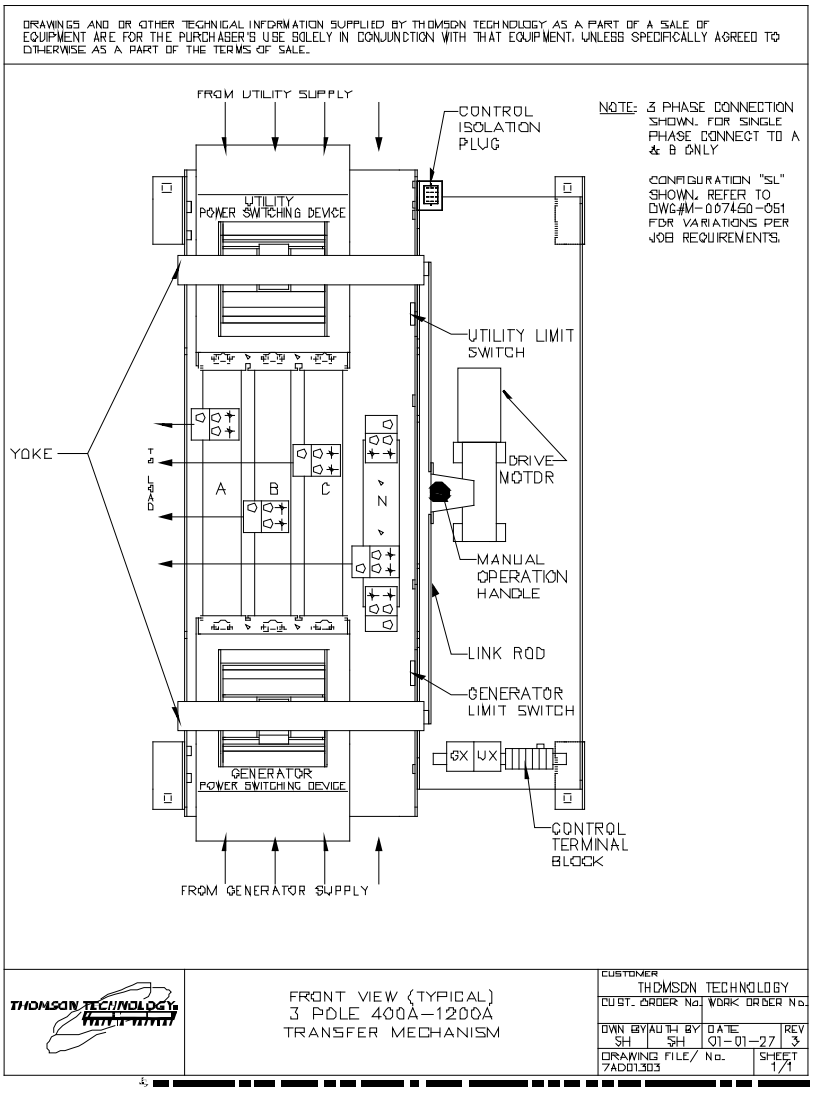
10.9. Transfer Mechanism 600A-1200A - yoke pivot bearings and rod ends are permanently lubricated and do not require maintenance.

10.10. The motor and gearbox are permanently lubricated, and should not require attention under normal operating circumstances.

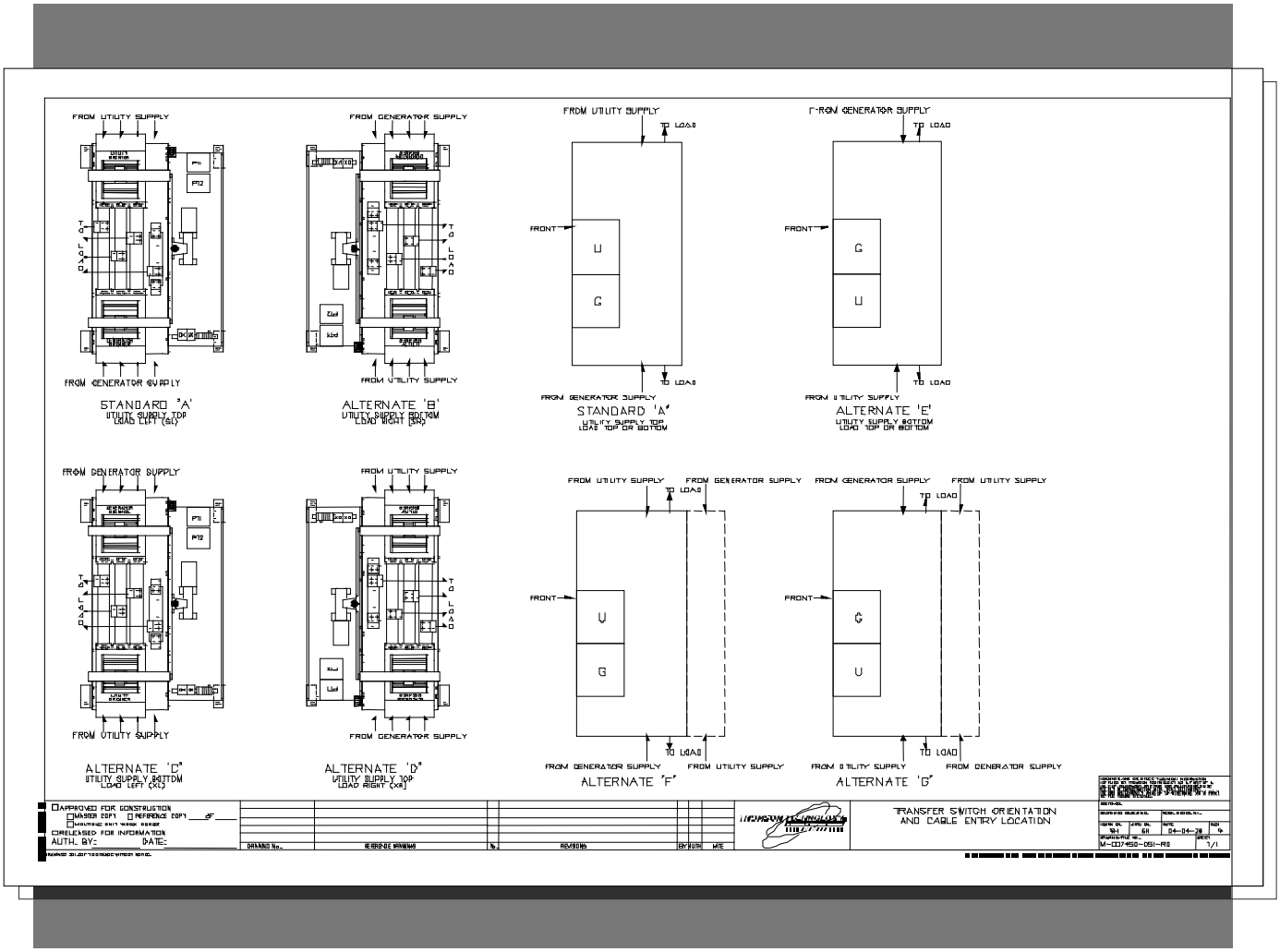
11. FRONT VIEW (TYPICAL) 3 / 4 POLE 100A-400A TRANSFER MECHANISM



12. FRONT VIEW (TYPICAL) 3 / 4 POLE 600A-1600A TRANSFER MECHANISM



13. CONNECTION CONFIGURATION OPTIONS



14. CABLE TERMINAL INFORMATION

BASIC MODEL	TERMINAL RATING		CONNECTION TIGHTNESS (In-lbs)	
	QTY PER PHASE	RANGE	TERMINAL MOUNTING SCREW	CABLE CLAMP
TS 83xA-0063	1	#2–4/0	120	50
TS 83xA-0100	1	#2–4/0	120	50
TS 83xA-0160	1	#6–350MCM	120	120
TS 83xA-0250	1	#6–350MCM	150	275
TS 83xA-0400[1]	2	2/0–500MCM	72	275
TS 83xA-0630[1]	2	2/0–500MCM	72	275
TS 83xA-0800[1]	3	2/0–500MCM	110	375
TS 83xA-1000[1]	4	4/0–500MCM	375	375
TS 83xA-1200[1]	4	4/0–500MCM	375	375
TS 83xA-1600[1]	4	#2–600MCM	375	375

1. Optional terminal ratings are available in some models – Consult Thomson Technology.
2. For other model types not shown, contact Thomson Technology for further information.

15. ELECTRICAL RATINGS

MODEL TYPE	63/100A	160A	250A	400/630/800A	1000/1200A	1600A
Rated short circuit making capacity (Icm) kA	32	73.5	73.5	73.5	143	105
Rated short circuit breaking capacity (Icu) kA	16	35	35	35	50	50
Withstand rating fuse protected (kA)	100	100	100	100	100	100
Rated service short circuit breaking capacity (Ics) kA	8	26.2	35	35	50	50
Mechanical endurance (Number of Operations)	8500	7000	7000	4000	2500	2500

16. TROUBLESHOOTING

> ***CAUTION!!!***
>
> ***All trouble shooting/ service work performed must be done by qualified personnel only. Failure to do so may cause personal injury or death.***

Note: An optional hand held, plug-in Service Display Module (SDM) is available for the TSC 80 Transfer Controller. The SDM module provides an LCD screen to display additional detailed information on the operation and settings of the TSC 80 controller for simplified servicing/trouble shooting procedures. For detailed information, refer to the separate SDM module instruction manual (PM065).

Symptom	Possible Causes
Will not re-transfer to utility source upon restoration	- Isolation plug out - A test mode has been activated (check controller) - Utility voltage is below the pre-programmed limits (check utility source for adequate voltage) - A loose control connection - Faulty motor limit switch - Defective motor - Controller has incorrect voltage programming jumper setting for correct system voltage - Defective controller (verify output signals with circuit board mounted diagnostic LED's) - TSC 80/800 Controller has "Transfer Fail" alarm activated as indicated by flashing Load on Utility LED. Determine cause of alarm and rectify before TSC is reset - Isolation plug out
Will not transfer to generator source upon failure of utility source	- Generator set not producing enough voltage/frequency or output circuit breaker open - Controller has incorrect voltage programming jumper setting for correct system voltage - Warm-up time delay function has not timed out yet (verify controller timer setting) - A loose control connection - Faulty motor limit switch - Defective motor - Defective controller (verify output signals with circuit board mounted diagnostic LED's) TSC 80/800 Controller has "Transfer Fail" alarm activated as indicated by flashing Load on Generator LED. Determine cause of alarm and rectify before TSC 80 is reset
Transfer to generator source without a power failure in the utility source	- A test mode has been activated Utility supply voltage is slightly - below voltage sensing setpoints.

Symptom	**Possible Causes**
Will not re-transfer to utility source upon restoration	- Isolation plug out Verify controller has correct voltage programming jumper setting for system voltage - Defective controller (verify output signals with circuit board mounted diagnostic LED's) - TSC 80/800-Utility power switching device has tripped due to an over current condition and controller alarm activated as indicated by flashing Load on Utility LED. Determine cause of alarm and rectify before controller is reset.
Generator does not start up or stop when it should	- Verify remote engine control panel is set for automatic mode
No time delay when there should be	- Verify time delay setting of the controller
Power is not available at the load terminals but the utility or generator power switching device appears to be closed to a live source	- The power switching device's over current protection unit has opened due to a fault on the system. ". Correct the fault, and manually reset the power switching device in the transfer switch by moving it off and then on again with the manual operating handle - Limit switch incorrectly adjusted
The transfer switch has completed a transfer, but the motor has overheated and the internal thermal protector has opened	- Limit switch failure or improper adjustment has failed to disconnect motor - Binding or jamming of the transfer mechanism

17. REPLACEMENT PARTS

Replacement parts are available for the transfer switch as follows:

Note

When ordering replacement parts please provide the following information:

-Transfer Switch Model code (e.g. TS 873AA0200AS)

-Transfer Switch Serial Number (e.g. W-022345)

The above information can be found on the transfer switch equipment rating plate located on the outside of the ATS door.

Component Description	Thomson Technology Part Number	Comments
MEC 310 Controller	MEC310AXX1	Must configure program settings to match original controller settings
TSC 80 Controller Board	005712	Must set Program Jumper prior to use. Refer to TSC 80 Instruction Manual.
TSC 80 Lexan Faceplate	005336	Contact Thomson Technology Service Dept for installation procedures.
TSC 80 Rear Cover	005707	
Limit Switch 1 n/o, 1 n/c (all ATS Models)	004929	Must install and adjust for proper operation before use. Contact Thomson Technology Service Dept for installation/adjustment procedures
Transfer Switch Motor (100A-250A) 1 PH 120v	001077	Motor is supplied with gear box assembly. Contact Thomson Technology Service Department for installation procedures
Transfer Switch Motor (400A-1200A) 120V 1/10 hp 1 PH	001075	Motor is supplied with gear box assembly. Contact Thomson Technology Service Dept for installation procedures
120VAC Auxiliary Plug-in Relay, 11 pin Square (UX/GX)	001278	Must ensure coil voltage is correct
120VAC Auxiliary Plug-in Timer	001515	Must ensure coil voltage is correct
100VA Control Transformer	002159	

For other parts not listed, please contact Thomson Technology.

18. PRODUCT RETURN POLICY

Thomson Technology uses a Return Material Authorization (RMA) process. Please complete the Return Authorization Request Form (available on our web page) for return of goods, warranty replacement/repair of defective parts, or credit consideration and fax to the appropriate department.

Returns only: Sales Fax (604) 888-5606

Warranty replacement/Warranty Repair: Service Fax (604) 888-3370.

Upon receipt of your request, Thomson Technology will confirm with a copy of our Order Acknowledgement via fax advising the RMA number which should be used to tag the defective controller prior to shipment.

19. NOTES