OLYMPIAN™

POWER SYSTEMS, INC.

Owner's Manual

GTS "Y" Type

Automatic Transfer Switch

105-420 Ampere

This manual should remain with the unit.

Read the following information carefully before attempting to install, operate or service this equipment. Also read the instructions and information on tags, decals, and labels that may be affixed to the transfer switch. Replace any decal or label that is no longer legible.

DANGER! Connection of a generator to an electrical system normally supplied by an electric utility shall be by means of suitable transfer equipment so as to isolate the electric system from utility distribution system when the generator is operating (Article 701 Legally Required Standby Systems or Article 702 Optional Standby Systems, as applicable). Failure to isolate electric system by these means may result in damage to generator and may result in injury or death to utility workers due to backfeed of electrical energy.

Generac cannot possibly anticipate every possible cir cumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all-inclusive. If you use a procedure, work method or operating technique Generac does not specifically recommend, you must satisfy yourself that it is safe for you and others. You also must make sure the procedure, work method or operating technique that you choose does not render the transfer switch unsafe.

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert you to special instruction about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

DANGER

After this heading, you can read instructions that, if not strictly complied with, will result in personal injury or property damage.

WARNING

After this heading, you can read instructions that, if not strictly complied with, may result in personal injury or property damage.

CAUTION

After this heading, you can read instructions that, if not strictly complied with, could result in damage to equipment and/or property.

NOTE:

After this heading, you can read explanatory statements that require special emphasis.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the service are essential to preventing accidents.

Four commonly used safety symbols accompany the DANGER, WARNING and CAUTION blocks. The type of information each indicates follows:

This symbol points out important safety information that, if not followed, could endanger personal safety and/or property of you and others.

This symbol points out potential explosion hazard.

This symbol points out potential fire hazard.

This symbol points out potential electrical shock hazard.

GENERAL HAZARDS

- Any AC generator that is used for backup power if a NORMAL (utility) power source failure occurs, must be isolated from the NORMAL (utility) power source by means of an approved transfer switch. Failure to properly isolate the NORMAL and STANDBY power sources from each other may result in injury or death to electric utility workers, due to backfeed of electrical energy.
- Improper or unauthorized installation, operation, service or repair of the equipment is extremely dangerous and may result in death, serious personal injury, or damage to equipment and/or personal property.
- Extremely high and dangerous power voltages are present inside an installed transfer switch. Any contact with high voltage terminals, contacts or wires will result in extremely hazardous, and possibly LETHAL, electric shock. DO NOT WORK ON THE TRANSFER SWITCH UNTIL ALL POWER VOLTAGE SUPPLIES TO THE SWITCH HAVE BEEN POSITIVELY TURNED OFF.
- Competent, qualified personnel should install, operate and service this equipment. Adhere strictly to local, state and national electrical and building codes. When using this equipment, comply with regulations the National Electrical Code (NEC), CSA Standard; C22.1 Canadian Electric Code and Occupational Safety and Health Administration (OSHA) have established.
- Never handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. DANGEROUS ELECTRICAL SHOCK MAY RESULT.

- Because jewelry conducts electricity, wearing it may cause dangerous electrical shock. Remove all jewelry (such as rings, watches, bracelets, etc.) before working on this equipment.
- If you must work on this equipment while standing on metal or concrete, place insulative mats over a dry wood platform. Work on this equipment only while standing on such insulative mats.
- Never work on this equipment while physically or mentally fatigued.
- Keep the transfer switch enclosure door closed and bolted at all times. Only qualified personnel should be permitted access to the switch interior.
- In case of an accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor but AVOID DIRECT CONTACT WITH THE VICTIM. Use a nonconducting implement, such as a rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- When an automatic transfer switch is installed for a standby generator set, the generator engine may crank and start at any time without warning. To avoid possible injury that might be caused by such sudden start-ups, the system's automatic start circuit must be disabled before working on or around the generator or transfer switch. For that purpose, a SAFETY DISCONNECT is provided inside the transfer switch. Always set that switch to its MANUAL position before working on the equipment. Then place a "DO NOT OPERATE" tag on the transfer switch and on the generator.

1.1 INTRODUCTION

This manual has been prepared especially for the purpose of familiarizing personnel with the design, application, installation, operation and servicing of the applicable equipment. Read the manual carefully and comply with all instructions. This will help to prevent accidents or damage to equipment that might otherwise be caused by carelessness, incorrect application, or improper procedures.

Every effort has been expended to make sure that the contents of this manual are both accurate and current. Generac, however, reserves the right to change, alter or otherwise improve the product at any time without prior notice.

1.2 EQUIPMENT DESCRIPTION

The automatic transfer switch is used for transferring critical electrical load from a NORMAL (utility) power source to a STANDBY (emergency generator) power source. Such a transfer of electrical loads occurs automatically when the NORMAL power source has failed or is substantially reduced and the STANDBY source voltage and frequency have reached an acceptable level. The transfer switch prevents electrical feedback between two different power sources (such as the NORMAL and STANDBY sources) and, for that reason, codes require it in all standby electric system installations.

The transfer switch consists of a solid state intelligence circuit, a transfer mechanism and a control panel.

1.3 TRANSFER SWITCH DATA PLATE

A DATA PLATE is permanently affixed to the transfer switch enclosure. Use this transfer switch only with the specific limits shown on the DATA PLATE and on other decals and labels that may be affixed to the switch. This will prevent damage to equipment and property.

When requesting information or ordering parts for this equipment, make sure to include all information from the DATA PLATE.

Record your Model and Serial numbers in the space provided below for future reference.

MODEL #

SERIAL #

1.4 TRANSFER SWITCH ENCLOSURE

The standard switch enclosure is a National Electrical Manufacturer's Association (NEMA) 1 type. NEMA 1 type enclosures primarily provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.

1.5 SAFE USE OF TRANSFER SWITCH

Before installing, operating or servicing this equipment, read the SAFETY RULES (inside front cover) carefully. Comply strictly with all SAFETY RULES to prevent accidents and/or damage to the equipment. Generac recommends you make a copy of the SAFETY RULES and post them near the transfer switch. Also, be sure to read all instructions and information you may find on tags, labels and decals affixed to the equipment.

Two publications that outline the safe use of transfer switches are the following:

- National Electrical Code
- UL 1008, STANDARD FOR SAFETY-AUTOMATIC TRANSFER SWITCHES

2.1 INTRODUCTION TO INSTALLATION

This equipment has been wired and tested at the factory. Installing the switch includes the following procedures:

- Mounting the enclosure.
- Connecting power source and load leads.
- Connecting the generator start circuit.
- Installing/connecting any options and accessories.
- Testing functions.

2.2 UNPACKING

Carefully unpack the transfer switch. Inspect closely for any damage that might have occurred during shipment. The purchaser must file with the carrier any claims for loss or damage incurred while in transit.

Check that all packing material is completely removed from the switch prior to installation.

Attach any lifting device to the transfer switch mounting holes or brackets only. DO NOT LIFT THE SWITCH AT ANY OTHER POINT.

2.3 MOUNTING

Mounting dimensions for the transfer switch enclosure are in this manual. Enclosures are typically wall-mounted. Components are generally mounted in a standard NEMA 1-type enclosure. A NEMA 12, 3R, 4 & 4X are also available. See TRANSFER SWITCH OPTIONS, Section 3.15.

⚠ CAUTION ⚠

⚠ Handle transfer switches carefully when installing. Do not drop the switch. Protect the switch against impact at all times, and against construction grit and metal chips. Never install a transfer switch that has been damaged.

Install the transfer switch as close as possible to the electrical loads that are to be connected to it. Mount the switch vertically to a rigid supporting structure. To prevent switch distortion, level all mounting points. If necessary, use washers behind mounting holes to level the unit.

2.4 CONNECTING POWER SOURCE AND LOAD LINES

⚠ DANGER ⚠

⚠ Make sure to turn OFF both the normal (Utility) and standby (generator) power supplies before trying to connect power source and load lines to the transfer switch. Supply voltages are extremely high and dangerous. Contact with such high voltage power supply lines causes extremely hazardous, possibly lethal, electrical shock.

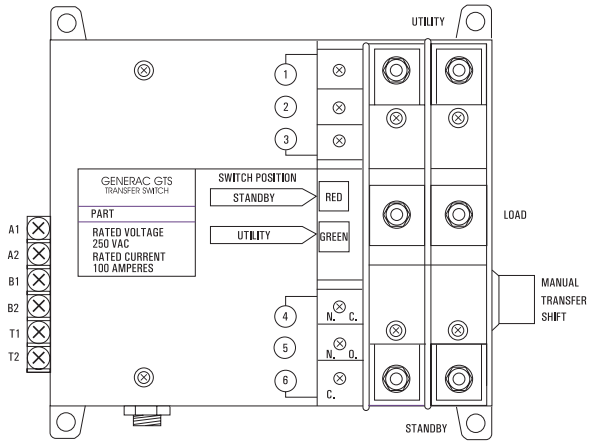
Wiring diagrams and electrical schematics are provided in this manual. Power source and load connections are made at a transfer mechanism, inside the switch enclosure.

◆ 2.4.1 TRANSFER MECHANISMS

The transfer mechanism may be either a 2-pole, 3-pole, or 4-pole type. The switch enclosure may include a NEUTRAL BLOCK for connection of the NEUTRAL line. Connect power source and load leads to transfer mechanism terminal lugs as follows:

- LOAD Leads: Connect to terminals T1, T2, T3, etc.
- NORMAL (utility) Source Leads: To terminals N1, N2, N3, etc.
- STANDBY (emergency) Source Leads: Connect to transfer mechanism terminal lugs E1, E2, E3, etc.

Figure 2.2 — Transfer Mechanism



NOTE:

Unless otherwise specified, a NEUTRAL block is not supplied with the transfer switch on single phase, 3-pole units where the NEUTRAL line is to be switched during transfer action. Similarly, a NEUTRAL block is not supplied on 3-phase, 4-pole units where the NEUTRAL line is to be switched during transfer.

Solderless, screw-type terminal lugs are standard. Conductor sizes must be adequate to handle the maximum current to which they will be subjected. The installation must comply fully with all applicable codes, standards and regulations.

Before connecting wiring cables to terminals, remove any surface oxides from the cable ends with wire brush. If ALUMINUM conductors are used, apply joint compound. Tighten terminal lugs to these torque values.

SWITCH RATING	TORQUE VALUE
100 ampere switches	50 inch-pounds (6 N-m)
All other switches	250 inch-pounds (26 N-m)

All power cables should enter the switch next to transfer mechanism terminals. Standard terminal lugs on the transfer mechanism are solderless, screw-type.

Be sure to maintain proper electrical clearance between live metal parts and grounded metal. Allow at least 1/2 inch for 100-400 amp circuit; at least 1 inch for circuits over 400 amps.

2.5 CONNECTING START CIRCUIT WIRES

Connect suitable, approved wiring to transfer switch terminals 178 and 183 (see chart below). Route these wires through suitable, approved conduit and connect to identically numbered terminals in the AC connection (lower) panel of Generac power systems (engine-generator set). See Figure 2.4.

Closure of Wire 178/183 circuit by switch circuit action must result in generator engine cranking and startup.

NOTE:

The preceding applies to the standard 2-WIRE START SYSTEM. If a generator having a 3-WIRE START SYSTEM is to be installed, using the optional 3-WIRE START SYSTEM. See TRANSFER SWITCH OPTIONS, Section 3.15.

Recommended wire gauge sizes for this wiring depends on the length of the wire, as recommended below:

MAXIMUM WIRE LENGTH	RECOMMENDED WIRE SIZE
460 feet (140m)	No. 18 AWG.
461 to 730 feet (223m)	No. 16 AWG.
731 to 1,160 feet (354m)	No. 14 AWG.
1,161 to 1,850 feet (565m)	No. 12 AWG.

2.6 AUXILIARY CONTACTS

If desired, you can access a set of Auxiliary Contacts on the transfer switch to operate customer accessories, remote advisory lights, or remote annunciator devices. A suitable power source must be connected to the COMMON (C) terminal. The contacts labeled 1, 2, and 3 are connected at the factory for operation of transfer switch advisory lights. Contacts 4, 5, and 6 are available for customer use.

Figure 2.5 — Auxiliary Contact Diagram

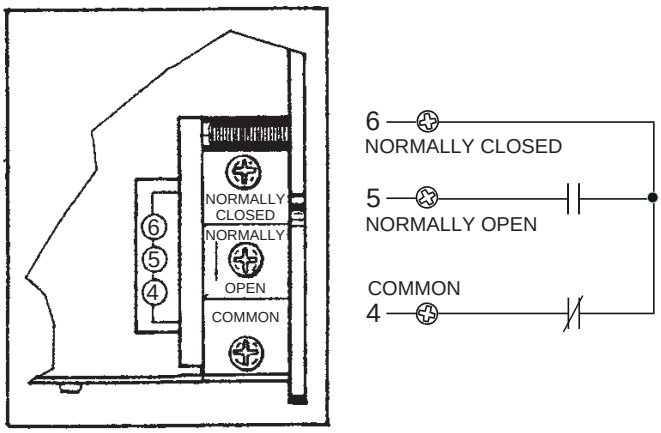
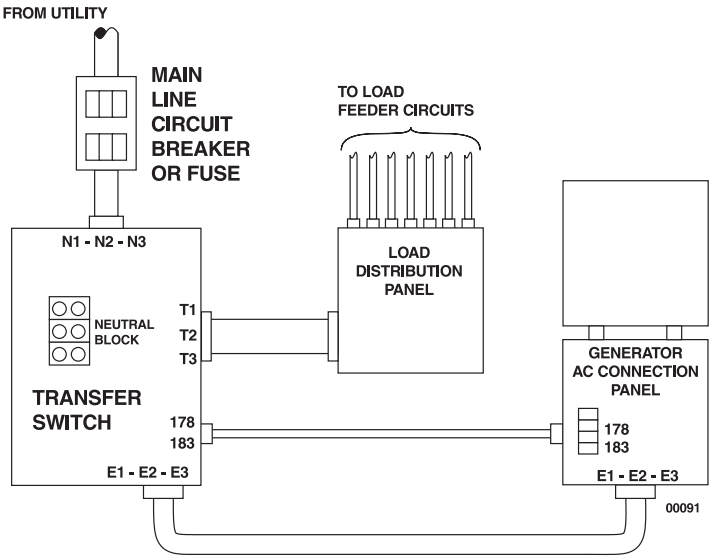


Figure 2.4 — Connection Diagram - 3-Phase With Neutral Shown (Typical)



Auxiliary Contacts are rated 15 amps at 125 or 250 or 480 volts AC; 0.5 amps at 125 volts DC; 0.25 amps at 250 volts DC. DO NOT EXCEED THE RATED VOLTAGE AND CURRENT OF THE CONTACTS. Contact operation is shown in the following chart:

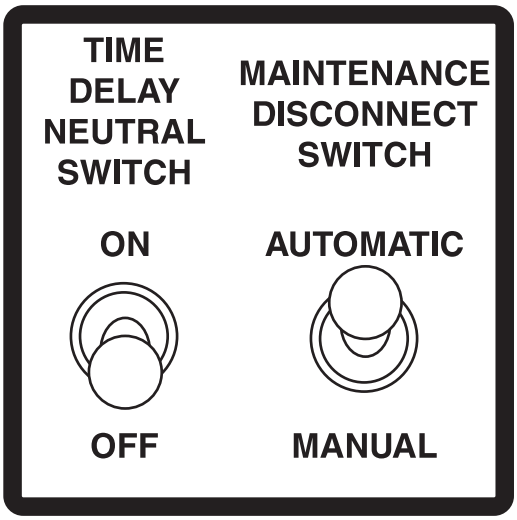
	Switch Position	
	Utility	Standby
Common to Normally Open	Closed	Open
Common to Normally Closed	Open	Closed

2.7 TIME DELAY NEUTRAL ON-OFF SWITCH

The Time Delay Neutral feature extends the time that the main contacts normally disconnect. By permitting the LOAD to remain disconnected from both power sources for a fixed time setting, residual voltages generated by heavy inductive loads will decay to a safe level before reconnecting. This provides some protection against nuisances such as blown fuses or circuit breakers that otherwise might occur during a rapid transfer of motor and other heavy inductive loads.

Units with the Time Delay Neutral feature are equipped with a Time Delay On/Off switch. To eliminate the time delay at neutral during a transfer action, set the switch to OFF.

Figure 2.6 — Time Delay Neutral Switch



2.8 OPTIONAL ACCESSORIES

Note any optional accessories that may be installed on the transfer switch or are to be installed in the standby electric system in conjunction with the switch. Complete the necessary connections for these accessories.

3.1 FUNCTIONAL TESTS AND ADJUSTMENTS

Following transfer switch installation and interconnection, inspect the entire installation carefully. A competent, qualified electrician should inspect it. The installation should comply strictly with all applicable codes, standards, and regulations. When absolutely certain the installation is proper and correct, complete a functional test of the system. Perform functional tests in the exact order presented in this manual, or you could damage the switch.

IMPORTANT: Before proceeding with functional tests, read and make sure you understand all instructions and information in this section. Also read the information and instructions of labels and decals affixed to the switch. Note any options or accessories that might be installed and review their operation.

3.2 MANUAL OPERATION

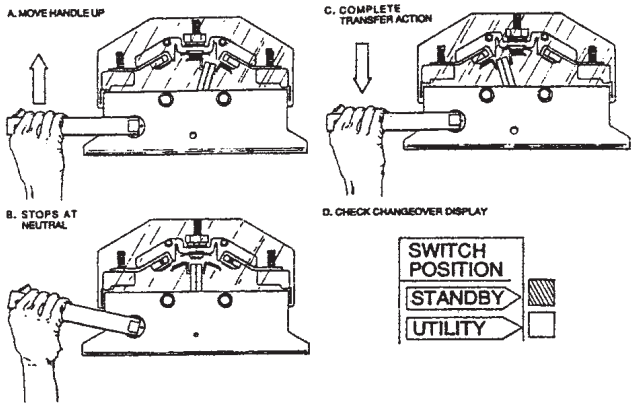
⚠ DANGER ⚠

Do NOT attempt manual transfer operation until all power voltage supplies to the transfer switch have been positively turned OFF. Failure to comply with this rule may result in extremely dangerous and possibly lethal electrical shock.

A manual HANDLE was shipped with the transfer switch. To test the manual operation of transfer switch, proceed as follows:

1. Set the Maintenance Disconnect Switch to MANUAL (Figure 3.1).

Figure 3.1 — Manual Operation



2. If so equipped, turn the generator's Auto-Off-Manual switch to MANUAL.
3. Turn OFF both NORMAL and EMERGENCY power supplies to the transfer switch, with whatever means provided (such as the main line circuit breakers).

4. Place the slotted end of the Manual Transfer Handle over the square MANUAL TRANSFER SHAFT, lower corner of the transfer mechanism.
5. Move HANDLE up until it stops at NEUTRAL. Then move HANDLE down to complete transfer action.

CAUTION

Do not use excessive force when operating the transfer switch manually or you could damage the manual handle.

6. On the transfer mechanism front face, check the SWITCH POSITION indicator. The arrow with the word "STANDBY" should be pointing to a GREEN color band, indicating the LOAD terminals are now connected to the STANDBY terminals. (Arrow with the word "UTILITY" points to RED color band).
7. Repeat steps 5 and 6 several times, making sure the switch main contacts actuate to all positions.
8. When certain that switch operates normally, actuate the main contacts to their UTILITY (normal) positions.
9. Store and retain the manual handle in the place provided in the switch enclosure.

3.3 VOLTAGE CHECKS

DANGER

Disconnect all loads from the transfer switch until all voltage checks and phase rotation checks have been completed to prevent possible injury to personnel and, or damage to equipment.

For safety, set the maintenance disconnect switch (inside transfer switch enclosure) to its manual position before proceeding with voltage checks.

Before proceeding, check the transfer switch data PLATE for switch rated voltage. Make sure the data plate voltage is compatible with NORMAL and STANDBY power source voltages.

Proceed with caution. Do not touch electrically hot terminals, wires, etc. During the voltage checks, the transfer switch is electrically energized.

Perform voltage checks as follows:

1. Inside the transfer switch enclosure, set the Maintenance Disconnect switch to MANUAL.
2. If generator is so equipped, set the Manual-Off-Auto switch to OFF.
3. On the switch enclosure door, set SYSTEM TEST switch to AUTOMATIC MODE position.
4. Check that the GREEN indicator is visible in Utility Window "B". See MANUAL OPERATION for location of "A" and "B" windows.

IMPORTANT: DO NOT PROCEED UNTIL STEPS 1, 2, 3, AND 4 HAVE BEEN COMPLETED.

CAUTION

Before proceeding to voltage checks, manually connect the load to NORMAL power supply. Window "A" must indicate ON, Window "B" must indicate OFF before proceeding.

5. Turn ON the NORMAL (Utility) power supply to the transfer switch, with whatever means provided (such as the main line circuit breaker).

DANGER

The transfer switch is now electrically hot. Proceed with caution.

6. With UTILITY voltage available to the transfer switch, check that the SWITCH - POSITION UTILITY lamp on the enclosure door is ON. If the SWITCH - POSITION UTILITY lamp is OFF, turn off the utility power supply to the transfer switch by whatever means provided (such as the main line circuit breaker), then proceed back to Step 1 of "VOLTAGE CHECKS".
7. Inside the transfer switch enclosure door, locate the Utility Voltage Sensor Circuit Board. The UTILITY ON light (LED) should be ON.
8. With an accurate AC voltmeter, check the phase-to-phase (line-to-line) and phase-to-neutral (line-to-neutral) voltages present at transfer mechanism terminals N1, N2, N3 and neutral. SUPPLIED VOLTAGES MUST BE FULLY COMPATIBLE WITH TRANSFER SWITCH RATED VOLTAGE.

DANGER

Ensure that the phase rotation of NORMAL (Utility) power lines and transfer switch load power lines are compatible.

9. Refer to the standby generator instruction manual. Make sure the generator engine has been properly serviced and prepared for use, as outlined in that manual. Then start the generator engine manually. Let the engine stabilize and warm up for a few minutes.
10. Turn ON the STANDBY (GENERATOR) power supply to the transfer switch by whatever means provided (such as the main line circuit breaker).
11. With the generator running, check that the STANDBY - OPERATING light on the switch enclosure door is ON.

12. With an accurate AC voltmeter, check phase-to phase (line-to-line) and phase-to neutral (line-to neutral) voltages present at transfer mechanism terminals E1, E2 and E3. Also check AC frequency at those terminals. If frequency is incorrect, the engine governor may require adjustment. Generator AC output voltage and frequency must be compatible with transfer switch rated voltage and frequency.

⚠ DANGER ⚠

Ensure that the phase rotation of STANDBY (GENERATOR) power lines and transfer switch NORMAL (UTILITY) and load power lines are compatible.

13. If supplied voltage or frequency is incorrect, refer to standby generator Owner's Manual. If AC frequency is incorrect, adjust engine governed speed. If voltage is incorrect, adjust generator's voltage regulator or correct the problem.
14. When supplied voltage and frequency is correct, shut down the engine manually.

⚠ DANGER ⚠

Supplied voltages from both NORMAL (Utility) and STANDBY (Generator) power sources must be compatible with transfer switch rated voltage before proceeding.

15. Connect the transfer switch load to the transfer switch when "voltage checks" section has been completed. Connect the load to the transfer switch by whatever means provided [such as circuit breaker(s)], then proceed with the "ELECTRICAL OPERATION" section.

3.4 ELECTRICAL OPERATION

Test transfer system electrical operation as follows:

1. On the Utility Voltage Sensor circuit board, check that the UTILITY ON lamp (LED) is ON.
2. On the enclosure door, check that the Switch Position-Utility lamp is ON.

⚠ CAUTION ⚠

The UTILITY ON lamp (on circuit board) and the SWITCH POSITION-UTILITY lamp (on enclosure door) must both be ON before proceeding to Step 3.

3. Refer to the appropriate owner's manual. Be sure the standby generator is prepared for automatic operation.
4. In the switch enclosure, set the Maintenance Disconnect switch to AUTOMATIC.
5. Set the System Test switch to its NORMAL TEST MODE position. Generator startup and transfer to the STANDBY power source should occur. Refer to the SEQUENCE OF OPERATION, Section 3.13.

NOTE:

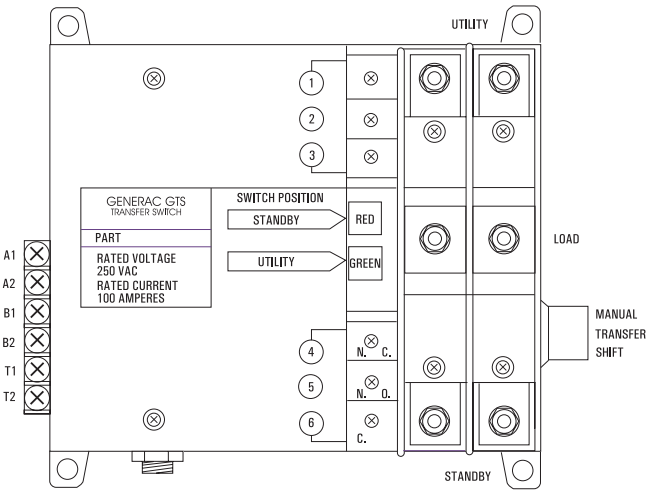
All systems are equipped with the Inphase Monitor Control board, and advisory lights on the circuit board will light up to indicate operation of the various solid state timers that control automatic operation. By observing these lights (LED's), the operator can check the automatic operating sequences and times. See SENSOR AND TIMER ADJUSTMENTS, Section 3.16. For a detailed description of the automatic operating sequences, see SEQUENCE OF OPERATION, Section 3.13.

6. When the test is complete, return the System Test Switch to its AUTOMATIC MODE position. Retransfer back to the UTILITY (normal) power source. The generator should shut down according to circuit board timers.

3.5 TRANSFER MECHANISM

The transfer mechanism main contacts are actuated by an electro-magnetic coil. Power for that coil's operation is taken from the side to which the LOAD is being transferred. Thus, transfer to any power source cannot occur unless that power source is available to the switch.

Figure 3.2 — The Transfer Mechanism



3.6 MAIN CONTACTS OPERATION

Often called a "Y-type" transfer mechanism, this unit is a single solenoid, electrically actuated, mechanically held type. Main contacts are 87% silver, 13% cadmium oxide. The illustration shows the main contacts with LOAD connected to UTILITY source (Figure 3.3), LOAD disconnected from both power sources (neutral) (Figure 3.4), and LOAD connected to the STANDBY power source (Figure 3.5).

Figure 3.3 — Main Contacts at Utility

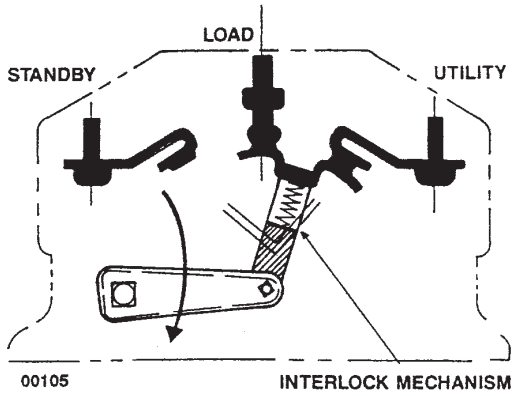


Figure 3.4 — Main Contacts at Neutral

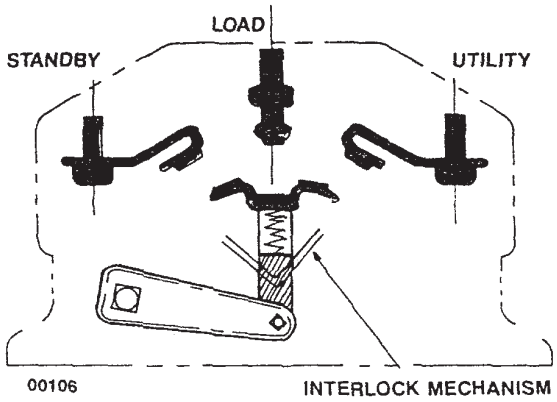
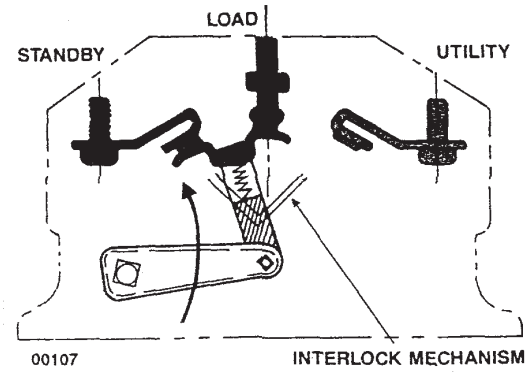


Figure 3.5 — Main Contacts at Standby (Emergency)



3.7 SWITCHES AND ADVISORY LAMPS

This section will familiarize the reader with switches and advisory lights on the transfer switch enclosure door, as well as with the Safety Disconnect Switch inside the switch enclosure.

Circuit board inside the switch door may also mount several switches. Operation of these switches will be covered in the section entitled SENSOR AND TIMER ADJUSTMENTS.

3.8 SYSTEM TEST SWITCH

This switch permits operator selection of AUTOMATIC, NORMAL TEST or FAST TEST mode as follows (Figure 3.6):

◆ 3.8.1 AUTOMATIC MODE

Use this switch position for all normal automatic operations. With AUTOMATIC MODE selected, any NORMAL source voltage that dropped below a pre-set value will result in the automatic sequence of events listed in the chart in Section 3.14.

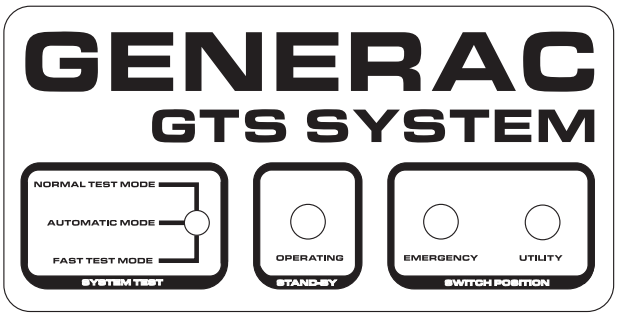
◆ 3.8.2 NORMAL TEST MODE

Permits the operator to test automatic operations, just as though an actual drop in NORMAL source voltage had occurred. See the chart in Section 3.14. During the test, observe the lights (LED's) on the transfer switch circuit board to monitor automatic operating sequences.

◆ 3.8.3 FAST TEST MODE

Permits the operator to test system operation with all circuit board timers accelerated to less than five seconds. Switch is spring-loaded back to AUTOMATIC MODE, so continuously press the FAST TEST CONTROL. Following the generator startup, loads are transferred to the EMERGENCY (standby) power source as soon as EMERGENCY source voltage and frequency have reached the settings of STANDBY VOLTAGE and STANDBY FREQUENCY sensors on the SYSTEM CONTROL board.

Figure 3.6 — System Test Switch, Standby Operating Light, and Switch Position Light



3.9 STANDBY-OPERATING LIGHT

This light will go ON to tell the operator that the standby generator is running and that STANDBY (emergency) source power is available to the transfer switch.

3.10 SWITCH POSITION LIGHT

◆ 3.10.1 EMERGENCY

The light will go ON when main current-carrying contacts have actuated to their STANDBY (emergency) position and that power source is available to the transfer switch.

◆ 3.10.2 UTILITY

Light will go ON when main contacts have actuated to NORMAL (utility) position and that power supply is available to the transfer switch.

The switch is equipped with the Inphase Monitor Control circuit board. The sensors and timers are adjustable (see SENSOR AND TIMER ADJUSTMENTS).

3.11 SEQUENCE OF OPERATION

When acceptable NORMAL source voltage is available, you can observe the following:

- Utility voltage Sensor circuit board monitor's NORMAL source voltage and UTILITY ON lamp is ON.
- Switch Position - UTILITY lamp is ON.
- Transformer reduced LOAD (T) terminal voltage is delivered to the 7-day exerciser board to operate the 7-day exercise timer.

If you want, you can monitor automatic timers and sensors on the Inphase Monitor Control circuit board, by observing light emitting diodes (LED's) next to the sensor/timer adjustments.

◆ 3.11.1 SEQUENCE 1 - VOLTAGE DROPOUT

- UTILITY source voltage drops below 75-95% of the Voltage Pickup Setting (factory set to about 80%). The UTILITY ON lamp goes OFF.
- Voltage Dropout sensor is factory set to about 80% of "pickup" voltage.
- Voltage dropout below this sensor's setting triggers Sequence 2.

◆ 3.11.2 SEQUENCE 2 - LINE INTERRUPT DELAY

- UTILITY voltage dropout below setting of Voltage Dropout sensor turns on a lIne Interrupt Delay Timer.
- Line Interrupt Delay may be set for 0.1 to 10 seconds; has been factory set to about 5 seconds.
- If voltage dropout lasts longer than Line Interrupt Delay setting, circuit board action closes the automatic start circuit (Wires 178 and 183). When that circuit closes, engine cranks and starts as controlled by a circuit board in the generator's control panel.
- Once the standby generator starts, circuit board is turned ON (go to Sequence 3).

◆ 3.11.3 SEQUENCE 3 - ENGINE MINIMUM RUN AND WARMUP TIMERS

- This timer establishes the minimum length of time for the generator to run before you can shut it down. Timer prevents shutdown of a cold engine.
- Timer is adjustable from 5 to 30 minutes; factory setting is about 20 minutes.
- An engine warmup timer is also turned ON. This timer permits engine to stabilize and warm up before loads are transferred to STANDBY. Timer is adjustable from 5 seconds to 3 minutes; factory setting is about 1 minute.

◆ 3.11.4 SEQUENCE 4 - STANDBY VOLTAGE AND FREQUENCY SENSORS

- If generator AC output voltage and frequency is above the setting of these sensors, loads transfer to the STANDBY power source.
- Adjust Standby Voltage Sensor between 75% and 95% or nominal supply frequency; factory setting is about 90%.
- Adjust Standby Frequency Sensor between 80% and 90% or nominal supply frequency; factory setting is about 90%.

NOTE:

You can bypass the engine warmup timers by setting the Engine Warmup Timer Bypass switch to ON. Loads are transferred to STANDBY as soon as generator AC voltage and frequency have reached the settings of the Voltage and Frequency sensors without having to wait for the engine to warm up.

◆ 3.11.5 SEQUENCE 5 - VOLTAGE PICKUP

- If the UTILITY source voltage is restored above the setting of the Voltage Pickup sensor, Sequence 5 begins.
- Adjust Voltage Pickup between 85% to 95% of the normal supply voltage from the UTILITY source; factory setting is about 90%.

◆ 3.11.6 SEQUENCE 6 - RETURN TO UTILITY TIMER

- This timer prevents re-transfer that a Utility Source voltage surge or transient might cause.
- Adjust timer between 1 to 30 minutes; factory setting is about 5 minutes.

- If UTILITY voltage remains above the setting of the Voltage Pickup Sensor for the time interval of the Return to Utility Timer setting, loads are re-transferred back to the UTILITY source.

◆ 3.11.7 SEQUENCE 7 - ENGINE COOL DOWN TIMER

- After the switch re-transfers loads back to UTILITY, this timer starts. When the interval has "timed out", the automatic start circuit (Wires 178/183) is opened, and the engine shuts down.
- Timer permits engine to run at no-load for a fixed time, so the engine internal temperature can stabilize before shutting down.
- Set the timer for 1-30 minutes; factory setting is about 10 minutes.

NOTE:

Actual time between re-transfer back to UTILITY and engine shutdown is whichever is longer of the Engine Cool Down timer setting or any time remaining on Engine Minimum run timer.

After the switch automatically re-transferred loads back to the UTILITY power source and generator has shut down, the system is "armed" for Sequence 1 again.

3.13 TRANSFER SWITCH OPTIONS

The transfer switch may be equipped with one or more of the following options:

- 3-wire Start System
- Instrument Package
- Deluxe Exerciser Circuit Board
- NEMA 3R, 4, 4X, or 12 Enclosure

3.12 SEQUENCE OF OPERATION SETTINGS

Units with Inphase Monitor Control Circuit Board

SEQUENCE	ACTION	TIMER/SENSOR	ADJUST RANGE	FACTORY SETTING
—*	UTILITY volts available - no action	Voltage Dropout Sensor	75 - 95%	80%
A*	UTILITY voltage drops out	Voltage Dropout Sensor	75 - 95%	80%
B	Line Interrupt Delay Timer Starts	Line Interrupt Delay Timer	0.1 - 10 seconds	5 seconds
C	Line Interrupt Delay Timer Stops	Line Interrupt Delay Timer	.01 - 10 seconds	5 seconds
—	Engine cranks and starts			
D	Engine Minimum Run Timer starts	Engine Minimum Run Timer	5 to 30 minutes	20 minutes
E**	Engine Warmup Timer Starts	Engine Warmup Timer	5 sec. - 3 min.	1 minute
F	STANDBY ON lamp ON			
G**	Engine Warmup Timer stops	Engine Warmup Timer	5 sec. - 3 min.	1 minute
H	Is STANDBY voltage good?	Standby Voltage Sensor	75 - 95%	90%
J	Is STANDBY frequency good?	Standby Frequency Sensor	80 - 90%	90%
K	Time Delay at NEUTRAL	Time Delay Neutral Timer	0.1 - 10 seconds	5 seconds
L	Inphase Transfer	Inphase Transfer Select	None	
—	Transfer to STANDBY			
M	TRANSFER TO STANDBY lamp ON			
—	STANDBY source powers LOAD			
N	UTILITY voltage restored	Voltage Pickup Sensor	85 - 95%	90%
O	Return to UTILITY Timer ON	Return to Utility Timer	1 - 30 minutes	5 minutes
P	Timed Delay at NEUTRAL	Time Delay Neutral Timer	0.1 - 10 seconds	5 seconds
R	Inphase Transfer	Inphase Transfer Select	none	0.1 - 30 seconds
S	Signal Before Transfer LED lights	Signal Before Transfer Timer	1 - 30 seconds	10 seconds
—	Re-transfer to UTILITY source			
T***	Engine Cooldown Timer starts	Engine Cooldown Timer	1 - 30 minutes	10 minutes
U***	Engine Cooldown Timer stops	Engine Cooldown Timer	1 - 30 minutes	10 minutes
—	Engine shuts down			
—	UTILITY volts available - no action			

* 75 - 95% of the Voltage Pickup Sensor setting

** Engine Warmup Timer can be bypassed. See SENSOR AND TIMER ADJUSTMENTS

*** Following re-transfer to UTILITY source, engine shutdown will not occur until both Engine Minimum run and Engine Cooldown timers have timed out.

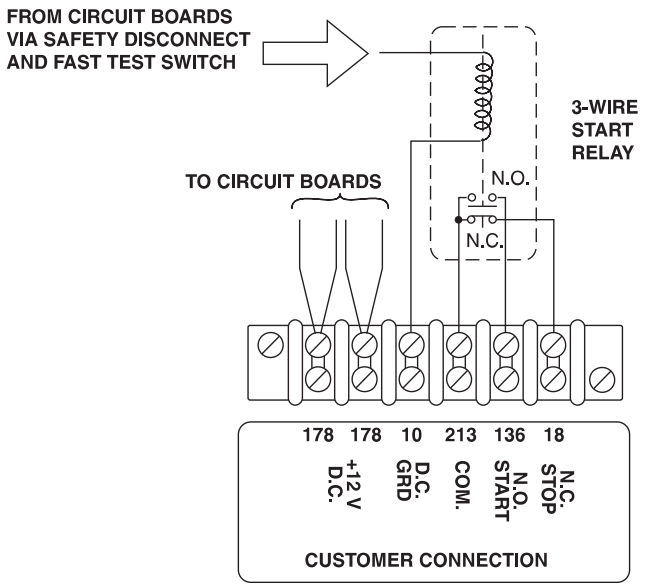
◆ 3.13.1 3-WIRE START SYSTEM

The standard generator start circuit on Generac transfer switches is a "2-wire" type. If the standby generator being installed has a "3-wire" start/stop system, you may need to use a transfer switch with a 3-wire system.

The optional 3-wire start system includes a 6-point terminal strip, a control relay, terminal strip decal and required wiring (Figure 3.7). These components are shown in the REPAIR PARTS section. Terminal strip connections are shown below:

- Terminal 178 - + 12 volts DC supply. On Generac generators, connect to generator Terminal #15.
- Terminal 10 - Common ground. Connect to negative (-) side of the DC supply circuit (to Terminal #10 on Generac generators).
- Terminal 213 - Acts as the COMMON terminal for the normally-open (N.O.) START and the normally-closed (N.C.) STOP relay contacts.
- Terminal 136 - N.O. START terminal. On Generac generators, connect to generator Terminal #136.
- Terminal 18 - N.C. STOP terminal. On Generac generators, connect to generator Terminal #18.

Figure 3.7 — 3-Wire Start System



◆ 3.13.2 INSTRUMENT PACKAGE

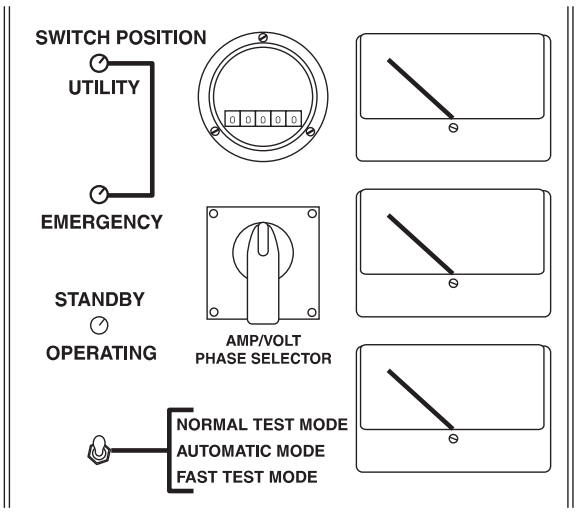
The optional instrument package includes (a) an AC voltmeter, (b) an AC ammeter, (c) an AC frequency meter, (d) an hourmeter, and (e) a phase selector switch. Several current transformers are required to operate the instrument package, i.e., two for single phase systems, three for 3-phase systems. Use the phase selector switch to select the 1-phase voltage and current being read as follows:

SWITCH OPERATION	CURRENT READING	VOLTAGE READING
1	Line 1	Line 1 to Neutral
2	Line 2	Line 2 to Neutral
3	No reading	Line 1 to Line 2
OFF	No reading	No reading

For 3-phase systems use the switch as follows:

SWITCH OPERATION	CURRENT READING	VOLTAGE READING
1	Phase A	Phase A to Phase B
2	Phase B	Phase B to Phase C
3	Phase C	Phase C to Phase A
OFF	No reading	No reading

Figure 3.8 — Instrument Package



◆ 3.13.3 OPTIONAL DELUXE EXERCISER CIRCUIT BOARD

See OPTIONAL DELUXE EXERCISER CIRCUIT BOARD SETTINGS, Section 3.21.

◆ 3.13.4 NEMA 12 ENCLOSURE

National Electrical Manufacturer's Association (NEMA) 12 enclosure. This type of enclosure is intended for use indoors to provide a degree of protection against dust, falling dirt, and dripping, non-corrosive liquids. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.5 NEMA 3R ENCLOSURE

National Electrical manufacturer's Association (NEMA) 3R enclosure. This type of enclosure is intended for use outdoors to protect enclosed parts from windblown dust and water. The enclosure is sealed for dust, rain or sleet and is ice resistant. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.6 NEMA 4 ENCLOSURE

National Electrical Manufacturer's Association (NEMA) 4 enclosure. This type of enclosure is intended for use indoors or outdoors to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water: undamaged by the formation of ice on the enclosure. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.7 NEMA 4X ENCLOSURE

National Electrical Manufacturer's Association (NEMA) 4X enclosure. This type of enclosure is intended for use indoors and outdoors to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water: undamaged by the formation of ice on the enclosure. Ask your Dealer/Distributor or consult the factory for details.

◆ 3.13.8 ADDITIONAL OPTIONS

For information on additional options not covered in this manual, ask you Dealer/Distributor or consult the factory.

3.14 SENSOR AND TIMER ADJUSTMENTS — SENSING CIRCUIT BOARD

◆ 3.14.1 VOLTAGE DROPOUT SENSOR

This sensor (Figure 3.9) establishes the NORMAL power source voltage which generator startup and transfer to STANDBY (Emergency) power source occurs. Adjust the sensor to any voltage between 75-95% of the nominal voltage Pickup Sensor setting, by turning the adjusting knob to the desired setting (in percent). Sensor is factory set to about 80% of the Voltage Pickup Sensor setting.

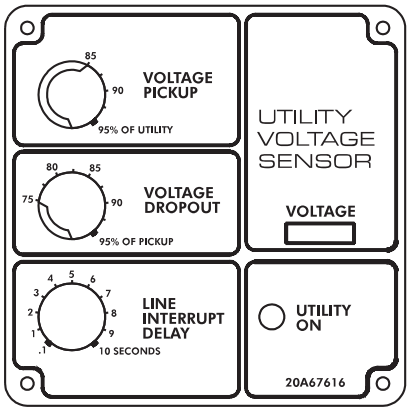
◆ 3.14.2 VOLTAGE PICKUP SENSOR

Establishes the NORMAL power source voltage at which re-transfer back to that power source occurs. Turn knob to adjust setting to 85-95% of the nominal NORMAL source supply voltage. Sensor has been factory set to about 90% of nominal rated NORMAL source voltage.

◆ 3.14.3 LINE INTERRUPT DELAY TIMER

Established a definite time interval between NORMAL source voltage dropout below the setting of the Voltage Dropout Sensor and generator startup. This time interval is necessary to prevent false generator starts that voltage transients might otherwise cause. Adjust timer from 0.1 to 10 seconds; is factory set to about five seconds.

Figure 3.9 — Sensing Circuit Board Panel



3.15 ADJUSTMENTS ON INPHASE MONITOR CONTROL CIRCUIT BOARD

The Inphase Monitor Control board is operational only when the generator set is running. Transfer will occur when UTILITY and GENERATOR voltage and phase are comparatively equal with a maximum difference of 20° between the power sources. To assure precision matching control, minimum voltage and frequency ranges are specified by the operator. In addition, each inphase control is programmed with the use of an onboard DIP switch to match the actuation time of the corresponding switch. Inphase transfer is used only between two live power sources and NOT during a UTILITY source failure. The Inphase Monitor Control board (Figure 3.10) is designed to transfer loads under the following conditions:

- When generator set frequency is between 58-62 Hz (48-52 Hz for 50 Hz systems).
- When generator set and utility power source frequencies are within 2 Hz.
- When the generator set and utility source voltage are within 85-100 percent of normal voltage.
- When both power sources are able to come into phase within 10 seconds.
- When less than 10 seconds has elapsed since the engine warmup timer has indicated "go ahead."

If any one of the preceding conditions are not met within 30 seconds, the system will automatically revert to Time delay Neutral (if selected). If Time Delay Neutral is not selected, the switch will transfer immediately after failing to do an inphase transfer within the 30 second window.

◆ 3.15.1 ENGINE WARMUP TIMER

Permits the engine to warm up before transferring LOAD from NORMAL to STANDBY power. Reset timer to any time interval between 5 seconds and 3 minutes; factory set to about 1 minute.

◆ 3.15.2 ENGINE MINIMUM RUN TIMER

Establishes the minimum length of time the generator must run before it can be shut down automatically. Timer prevents a cold engine from being shut down. It is factory set to about 20 minutes, but you can reset the interval between 5 and 30 minutes.

◆ 3.15.3 RETURN TO UTILITY TIMER

Establishes time interval between restoration of NORMAL source voltage above the setting of the Voltage Pickup Sensor and re-transfer back to that source. This time interval is necessary, to prevent re-transfer that otherwise might occur as a result of transient voltages. Timer may be reset to any interval between 1 and 30 minutes; factory set to about 5 minutes.

◆ 3.15.4 ENGINE COOL DOWN TIMER

Provides a time delay between automatic re-transfer back to the NORMAL source and engine shutdown. This permits internal engine-generator temperatures to stabilize at "no-load" prior to shutdown. Set timer between 1 and 30 minutes; factory set to about 10 minutes.

NOTE:

The actual time interval between re-transfer back to NORMAL and generator shutdown, is the time remaining on Engine Minimum Run timer or time setting of the Engine Cool Down Timer, whichever is longer.

◆ 3.15.5 STANDBY VOLTAGE SENSOR

After engine starts automatically, the system does not transfer LOAD to STANDBY power source until generator AC output voltage has reached the setting of this sensor. Factory set to about 90% of the nominal rated voltage, but you can reset between 75% and 95% of the unit's rated voltage.

◆ 3.15.6 STANDBY FREQUENCY SENSOR

This adjustment allows the installer or operator to select the minimum required frequency of the standby power source. It is adjustable between 80-90%. Factory set to 90%.

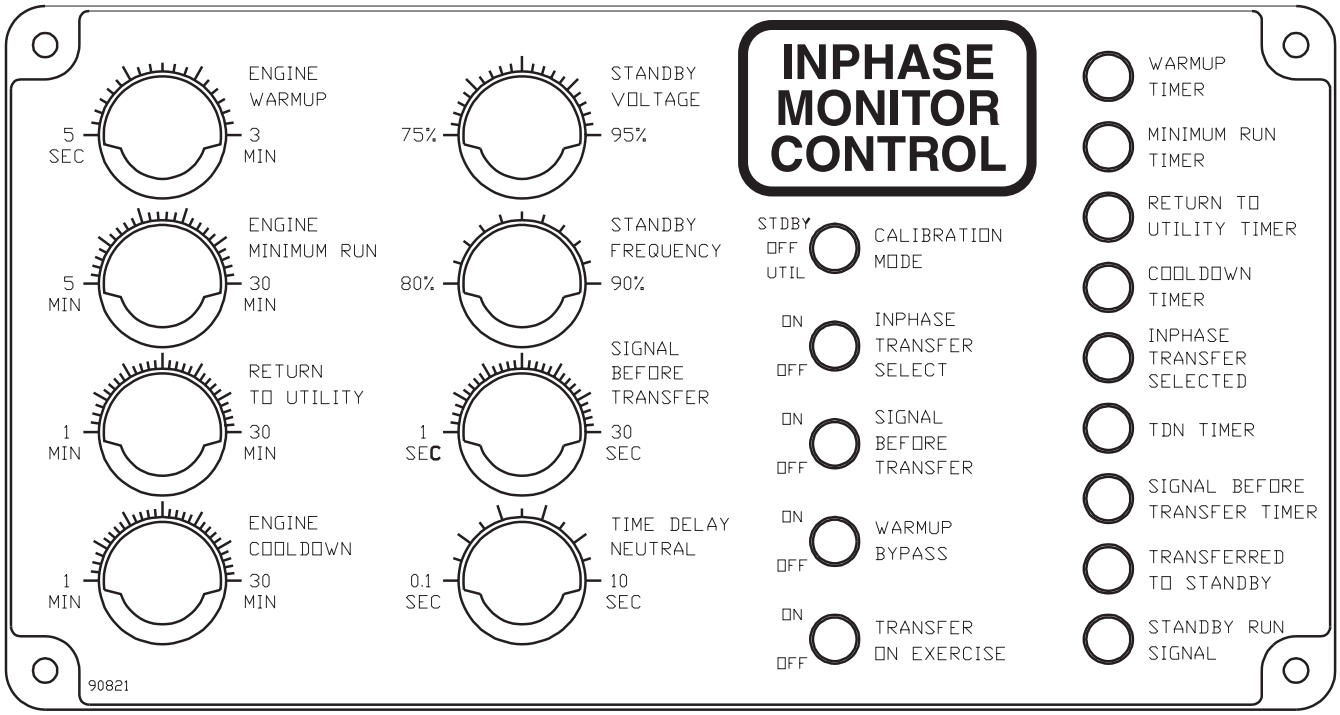
◆ 3.15.7 SIGNAL BEFORE TRANSFER TIMER

If you select this function, this timer will control the amount of time signal remains active. Timer is adjustable from 1 to 30 seconds; factory set to about 10 seconds.

NOTE:

The "Signal Before Transfer" feature provides a time delay that allows elevators to continue operating before transfer to another power supply occurs.

Figure 3.10 — Inphase Monitor Control Panel



◆ 3.15.8 TIME DELAY NEUTRAL

This timer holds the transfer mechanisms main contacts in the "Neutral" position for the time you have selected. "Neutral" is the main contacts position where the LOAD is disconnected from both UTILITY and STANDBY power supplies. Timer is adjustable from 0.1 and 10 seconds; factory set to about 5 seconds.

◆ 3.15.9 CALIBRATION MODE SWITCH

This switch has three positions, identified as "STDBY", "OFF" and "UTIL". The switch allows the installer or operator to calibrate the circuit board to the existing generator set output voltage and to the existing UTILITY power source voltage. The board must be calibrated to both power source voltages in order to initiate transfer and re-transfer at the correct voltages. To calibrate the circuit board to the correct voltage, see "Calibrating the Circuit Board."

◆ 3.15.10 INPHASE TRANSFER SELECT SWITCH

This switch allows the operator or installer to select either "Inphase Transfer" or "Time Delay Neutral" operation. The switch may be positioned as follows:

- Switch at ON: Inphase transfer operation is selected.
- Switch at OFF: Time Delay Neutral is activated if selected.

◆ 3.15.11 SIGNAL BEFORE TRANSFER SWITCH

This switch allows the operator or installer to select the "Signal Before Transfer" feature or to turn OFF the feature. To activate the feature, set the switch to ON. To turn off the feature, set the switch to OFF.

◆ 3.15.12 ENGINE WARMUP TIMER BYPASS SWITCH

To bypass Engine Warmup Timer and transfer as soon as generator voltage and frequency have reached the setting of the Standby Voltage and Frequency Sensors, set switch to ON. To place engine warmup Timer back into the automatic operating system, set the switch to OFF.

◆ 3.15.13 TRANSFER ON EXERCISE SWITCH

For transferring LOAD to the STANDBY source during the 7-day exercise cycle, set switch to ON. For no transfer during the exercise, set switch to OFF.

◆ 3.15.14 ADVISORY LAMPS

The advisory lamps on the Inphase Control board consist of 9 LED's (light emitting diodes) and include the following:

- The four red timer lamps will turn ON when their respective timers are activated.
- The "Inphase Transfer Selected" lamp goes ON when Inphase Transfer Select switch is set to ON, indicating the system will operate in its "Inphase" mode (and NOT in Time Delay Neutral mode).
- The Time Delay Neutral (TDN) Timer lamp will turn ON when the TDN timer is running.
- The Signal Before Transfer Timer lamp will turn ON for the duration of the Signal Before Transfer Timer, when it is turned ON.
- Transfer to Standby Lamp goes ON when LOAD has been transferred to STANDBY power source.
- Standby run Signal will go ON when the generator is running and the Inphase Monitor Control circuit board is operational and controlling the generator.

3.16 CALIBRATING THE INPHASE MONITOR CONTROL CIRCUIT BOARD

The Inphase Monitor circuit board must be calibrated to existing STANDBY and UTILITY source voltages if the system is to operate properly. To calibrate the circuit board, two adjustment potentiometers (R102 and R107) are provided in the lower left corner of the circuit board (Figure 3.11). The board must be calibrated as follows:

1. Check that UTILITY supply voltage is available to the system.
2. Start the generator, let it stabilize and warm up.
3. Set the Calibration Mode Switch to "STDBY" and observe the four top LED's on the circuit board (Warmup Timer, Minimum Run Timer, Return to Utility Timer and Cool down Timer). These are the RED lamps.
   - If the two upper LED's are illuminated, calibration is set too low.
   - If the two bottom LED's are illuminated, calibration is set too high.
4. On the circuit board, adjust potentiometer R102 until only the two center LED's are illuminated (Minimum Run and Return to Utility timers).
5. Now, set the Calibration Mode switch to "UTIL" and observe the four upper LED's on the circuit board.
6. Adjust potentiometer R107 until only two center LED's are illuminated (Minimum Run and Return to Utility).
7. Set the Calibration Mode Switch to "OFF". The Inphase Monitor Control board is calibrated.

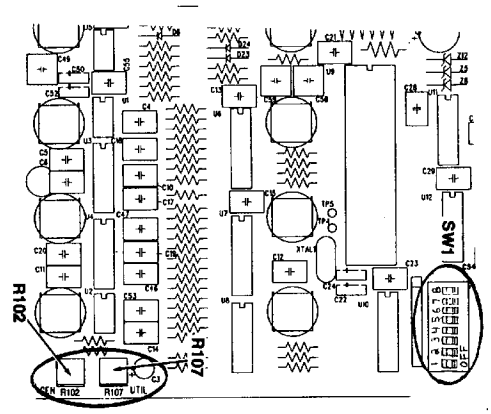
NOTE:

With the Calibration Mode Switch set to "STDBY" or "UTIL", the four top LED's should turn ON in sequence. That is, the lights should sweep on and off, from one light to the next. Calibration is obtained when the two center lamps of the four (Minimum Run and Return to Utility) are illuminated. This establishes 100% rated voltage.

NOTE:

The Inphase Monitor Control circuit board should be calibrated when the transfer switch has been installed as part of an operating system. Also, replacement circuit boards must be calibrated.

Figure 3.11 — Inphase Monitor Control Circuit Board



3.17 CIRCUIT BOARD SWITCH SW1

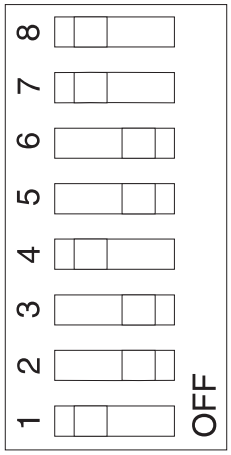
On the Inphase Monitor Control Board, a switch assembly consisting of a bank of eight miniature switches is identified as "SW1" is usually set up at the factory and should require no additional configuring (Figure 3.12).

NOTE:

On boards not installed at the factory, SW1 must be set by the installer. SW1 must be set to match the type of transfer switch in which the board is installed.

The individual switches on SW1 are numbered from "1" (bottom) through "8" (top), as shown in figures 3.11 and 3.12. To make the circuit board compatible to the specific transfer switch assembly, set the switches as indicated in the chart below. Improper settings may cause transfer outside the 20-degree specification.

Figure 3.12 — Circuit Board Switch SW1



3.18 ADJUSTMENTS ON 7-DAY EXERCISER CIRCUIT BOARD

◆ 3.18.1 SET EXERCISE DAY AND TIME OF DAY

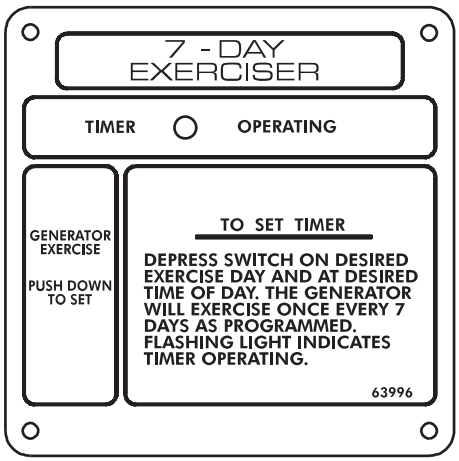
On the day and at the time of day you want the system to start and exercise, press the GENERATOR EXERCISE switch and hold it there for about 15 seconds. The generator will start and exercise 7 days later at the selected time of day.

DIP Switch Settings - Y-Type Transfer Switches

TRANSFER SWITCH	SWITCH RATED 208								SWITCH RATED 240							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
105 amps, 2-pole (63302)	*	on	off	on	on	off	on	off	*	on	off	on	on	on	on	off
105 amps, 3-pole (62642)	*	on	off	on	off	on	on	on	*	on	off	on	on	off	on	on
105 amps, 4-pole (63597)	*	on	off	on	off	off	on	off	*	on	off	on	off	on	on	off
150 amps, 2 pole (63312)	*	on	off	on	on	off	off	on	*	on	off	on	on	on	off	off
150 amps, 3-pole (62643)	*	on	off	on	off	on	off	on	*	on	off	on	on	off	on	off
150 amps, 4-pole (63599)	*	on	off	on	off	off	off	off	*	on	off	on	off	on	off	off
200 amps, 2-pole (62677)	*	on	off	on	off	off	on	off	*	on	off	on	off	on	on	off
200 amps, 3-pole (64198)	*	on	off	off	on	on	off	on	*	on	off	on	off	off	on	on
200 amps, 4-pole (63598)	*	on	off	on	off	off	on	on	*	on	off	on	on	off	off	on
300 amps, 2-pole (62645)	*	on	off	on	off	on	off	off	*	on	off	on	off	on	on	on
300 amps, 3-pole (62646)	*	on	off	on	off	on	on	on	*	on	off	on	on	on	off	off
300 amps, 4-pole (64100)	*	on	off	on	off	on	on	on	*	on	off	on	on	on	off	off
420 amps, 2-pole (62647)	*	on	off	on	off	on	off	off	*	on	off	on	off	on	on	on
420 amps, 3-pole (62648)	*	on	off	off	on	on	on	off	*	on	off	on	off	off	on	on
420 amps, 4-pole (64344)	*	on	off	on	off	off	on	off	*	on	off	on	on	off	off	on

* Set Switch 1 to OFF for 60 Hz systems; set Switch to ON for 50 Hz systems

Figure 3.13 — 7-Day Exerciser

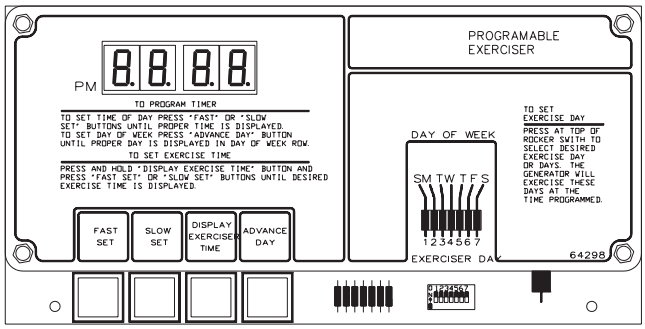


3.19 OPTIONAL DELUXE EXERCISE CIRCUIT BOARD SETTINGS

Always adjust the board in the exact order given (Figure 3.14).

1. Set Actual Day of Week: Locate the switch above which appears the words "ADVANCE DAY". Press this Advance Day switch while watching the lighted DAY OF WEEK indicator. That indicator advances one day each time you press the switch. You can stop when the actual current day of the week is displayed.
2. Set Actual Time of Day: Hold FAST SET switch down while watching the lighted chronograph at left side of circuit board. When close to actual current time of day, release the FAST SET switch. Then, use the SLOW SET switch to complete adjustment of actual time of day.

Figure 3.14 — Deluxe 7-Day Exerciser



3. Select Dat (or Days) of Exercise: A bank of eight miniature rocker switches is provided at right side of circuit board. Switches 1 through 7 correspond to days of the week (Sunday through Saturday respectively). Switch 8 is not used. To select a day of the week for system exercise, move the correct numbered switch to its ON position. A lighted band appears next to that day. In this manner, the system can be set to exercise one, two or more days each week.
4. Select Exercise Time of Day: Push down on switch below the words DISPLAY EXERCISE TIME. While holding that switch down, press FAST SET and SLOW SET switches until the time you want is displayed. A red dot next to the letters "PM" indicates p.m. times.

3.20 CALIBRATE UTILITY VOLTAGE SENSING CIRCUIT BOARD

The utility sensing interface reduces utility source voltage ar a fixed ratio. Thus, if utility voltage varies from the nominal, sensing voltage to the circuit board also varies. For that reason, you may need to calibrate the circuit board to match the system.

CAUTION

The installed transfer switch must be rated at a voltage and phase that is compatible with the utility and standby power supplies. DO NOT attempt to calibrate any utility voltage sensor board on any non-compatible unit trying to make the unit compatible.

Once the circuit board has been properly calibrated, the voltage that was present during calibration establishes 100 percent utility voltage for "pickup" and "dropout" settings. Utility source voltage must be available to the transfer switch during calibration.

NOTE:

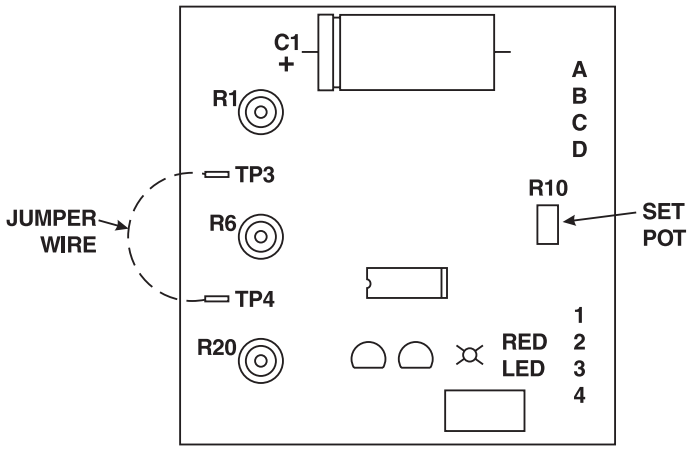
You must also use this procedure to calibrate a replacement circuit board. Follow these instructions:

1. In the transfer switch enclosure, set the Safety Disconnect Switch to "Manual".
2. On the Utility Voltage Sensor circuit board, locate test points "TP3" and "TP4" and install a jumper lead.
3. Locate the small potentiometer "R10". Turn the potentiometer fully counterclockwise.
4. Now, turn the "R10" potentiometer SLOWLY clockwise until the "Utility On" light emitting diode (LED) just turns ON.
5. Remove the jumper wire from "TP3" and "TP4".
6. Reset the Maintenance Disconnect switch to AUTOMATIC.

RESULTS:

- If the "Utility On" LED does NOT go on as described above, replace the utility voltage sensor board. Calibrate the new board and perform a "Normal Test" of the system.
- If the "Utility On" LED goes ON, discontinue the test.

Figure 3.15 — Utility Voltage Sensing Circuit Board



4.1 OPERATE TRANSFER SWITCH

Operate the transfer switch at least once each month. This can be done by performing a NORMAL TEST of the system. Because the System Test switch only simulates failure of the UTILITY power source, service will be interrupted only during the actual transfer of the load.

4.2 CLEAN AND INSPECT TRANSFER SWITCH

Protect the transfer switch against construction grit, metal chips, excessive moisture and other harmful dirt at all times. At least once each year turn OFF all power supplies to the switch, then brush and vacuum away dust and dirt that has accumulated inside the enclosure. After cleaning, inspect the transfer switch carefully. Look for evidence of arcing, burning, hot spots, charring and other damage. If any of these are found, have the switch assembly checked by an authorized service technician.

4.3 7-DAY EXERCISER

On each transfer action, the LOAD will be disconnected from both power sources for a brief interval. During such brief intervals, the exercise timer is powered by the 9 volt battery. However, the timer will not advance during the transfer. For that reason, it may be necessary to reset the exercise timer periodically.

4.4 LUBRICATION

Operating parts inside the transfer mechanism have been properly lubricated at the time of assembly. Under normal conditions no additional lubrication should be required. The service technician should lubricate all recommended points whenever major transfer mechanism components are replaced.

CAUTION

Use only specified greases to lubricate contactor parts. DO NOT USE ANY SUBSTITUTES.

Use the following lubricants for the:

1. Main Contacts (Between movable contact and busbars).
   - Dow Corning (Molykote) BR2 Plus; (Mfg. by Dow Corning Co., USA)
   - Liqui-Moly (Mfg. by DAI TO Co., Ltd., Japan)
2. Operating Mechanism (Used on the actuator and other parts of the contactors. Excluding the movable contacts).
   - Mobilgrease 28 (Mfg. by Mobil Oil Co.)
   - Mobiltemp SHC 32 (Mfg. by Mobil Oil Co.)
   - Polo Moly Complex Grease #NLG12 (Mfg. by Polo Lubricants, USA)
   - Rheolube 363 (Mfg. by Nye Lubricants Inc., USA)

4.5 MAIN CURRENT CARRYING CONTACTS

At least once annually, have an Authorized Service Technician check the main current carrying contacts in the transfer mechanism. He will repair or replace major components that have been found defective.

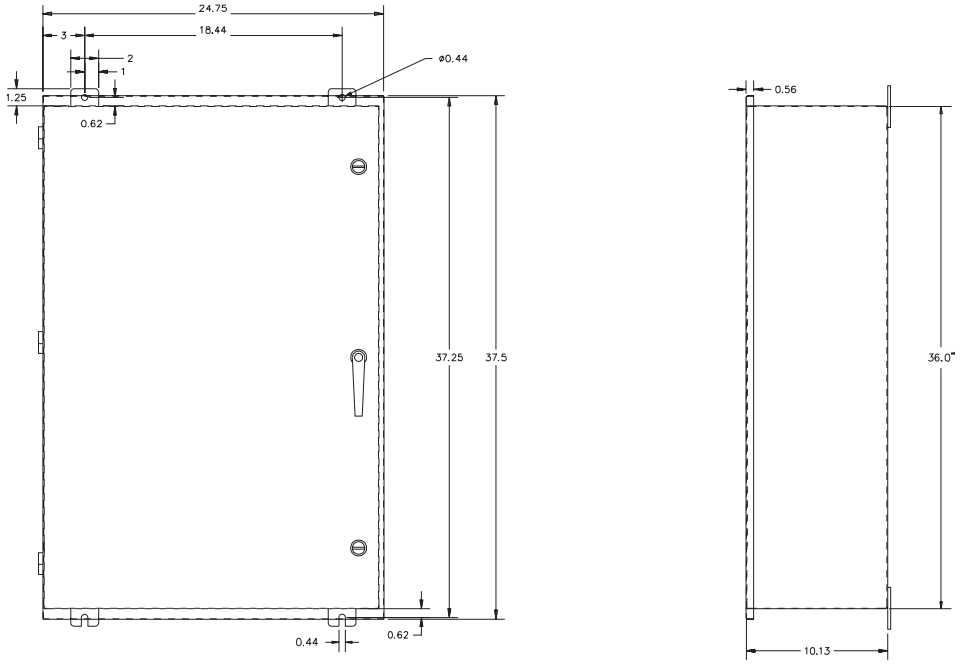
4.6 NINE-VOLT BATTERY

The transfer switch is equipped with an adjustable Inphase Monitor Control circuit board. The battery connects to a separate 7-day exerciser circuit board. Battery power for Exercise Timer operation is only needed during the short time interval when the transfer mechanism main contacts are at NEUTRAL position (LOAD disconnected from both power sources). It is recommended that the 9 volt battery be replaced once each year.

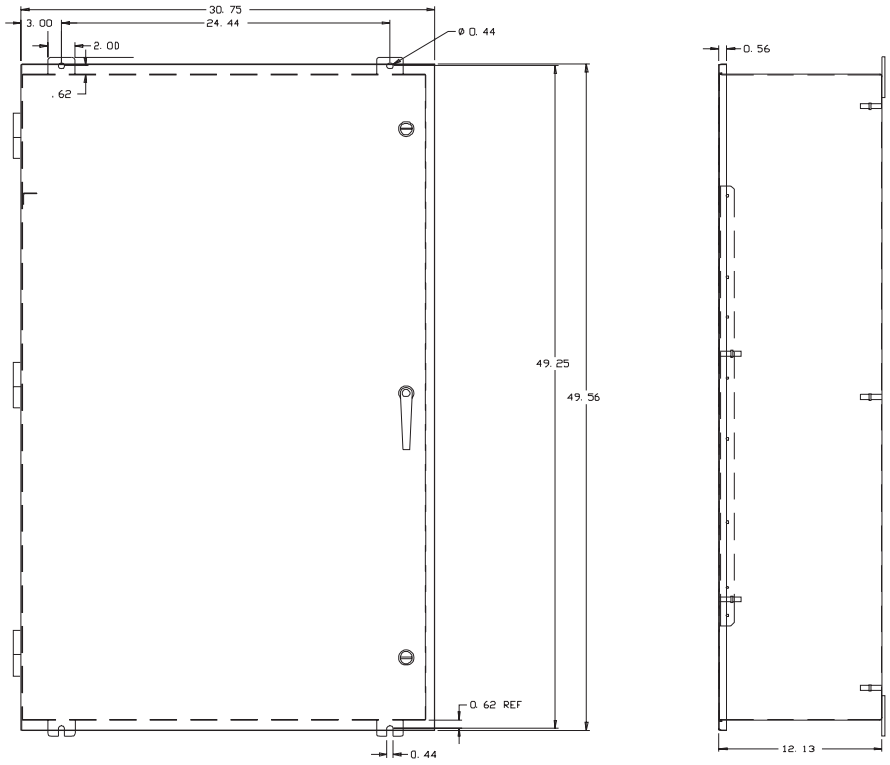
NOTES

NOTES

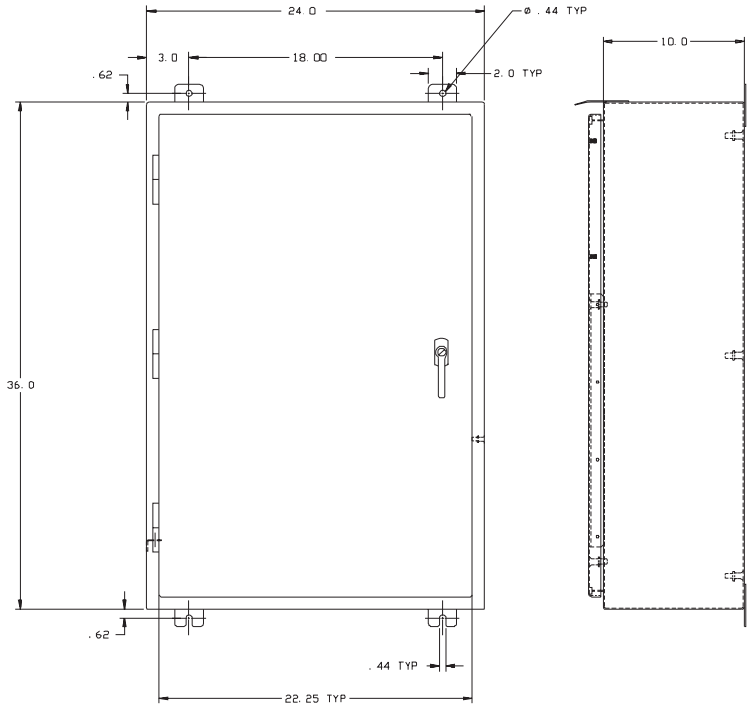
100-150 Amp NEMA 1 Units



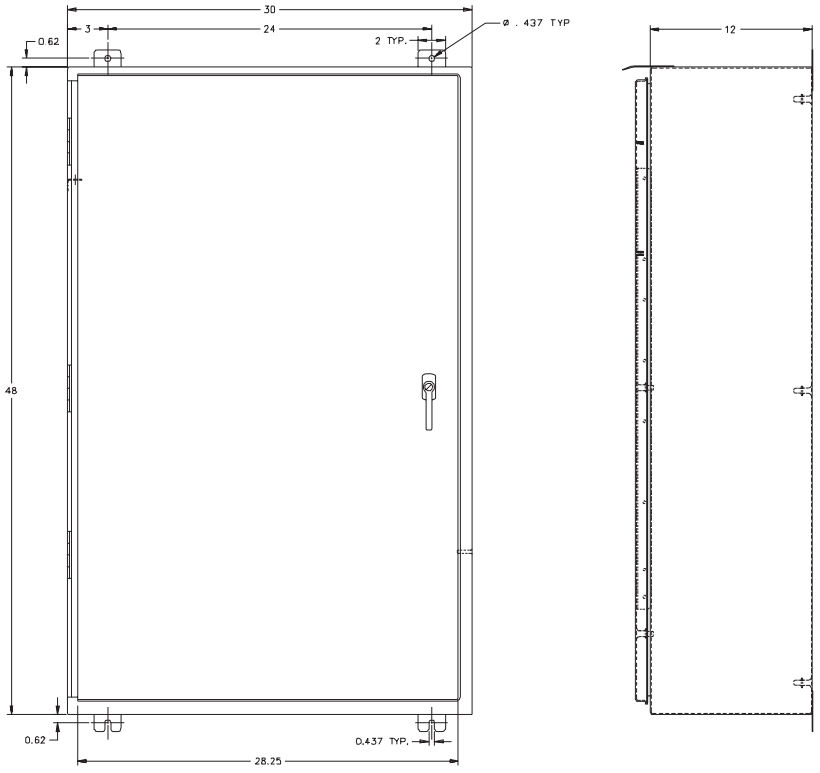
200-400 Amp NEMA 1 Units



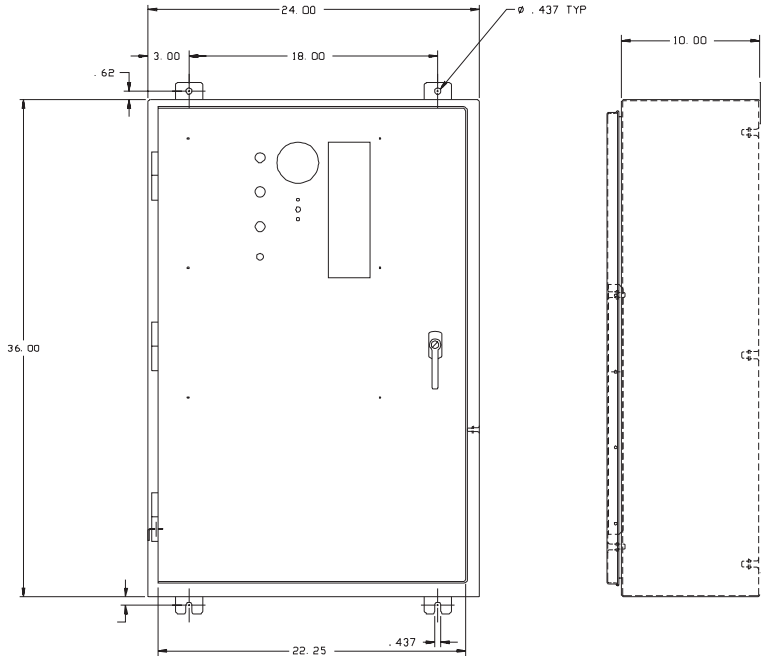
100-150 Amp NEMA 12, 3R, 4, and 4X Units (Typical)



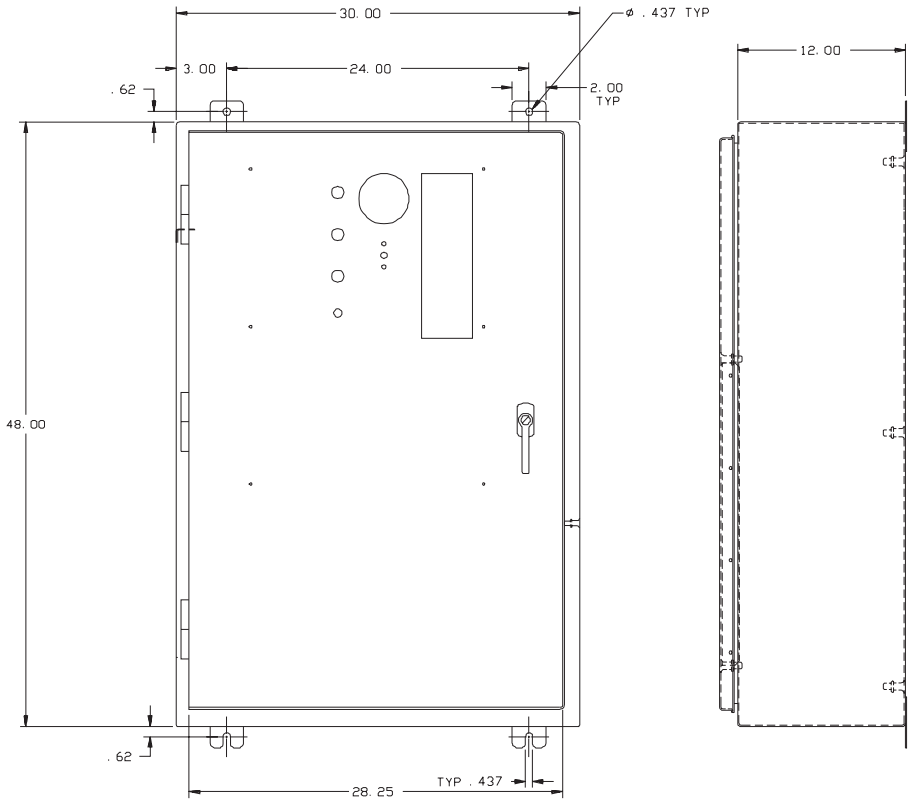
200-400 Amp NEMA 12, 3R, 4 and 4X Units (Typical)



100-150 Amp NEMA 12 Units With Instrument Package

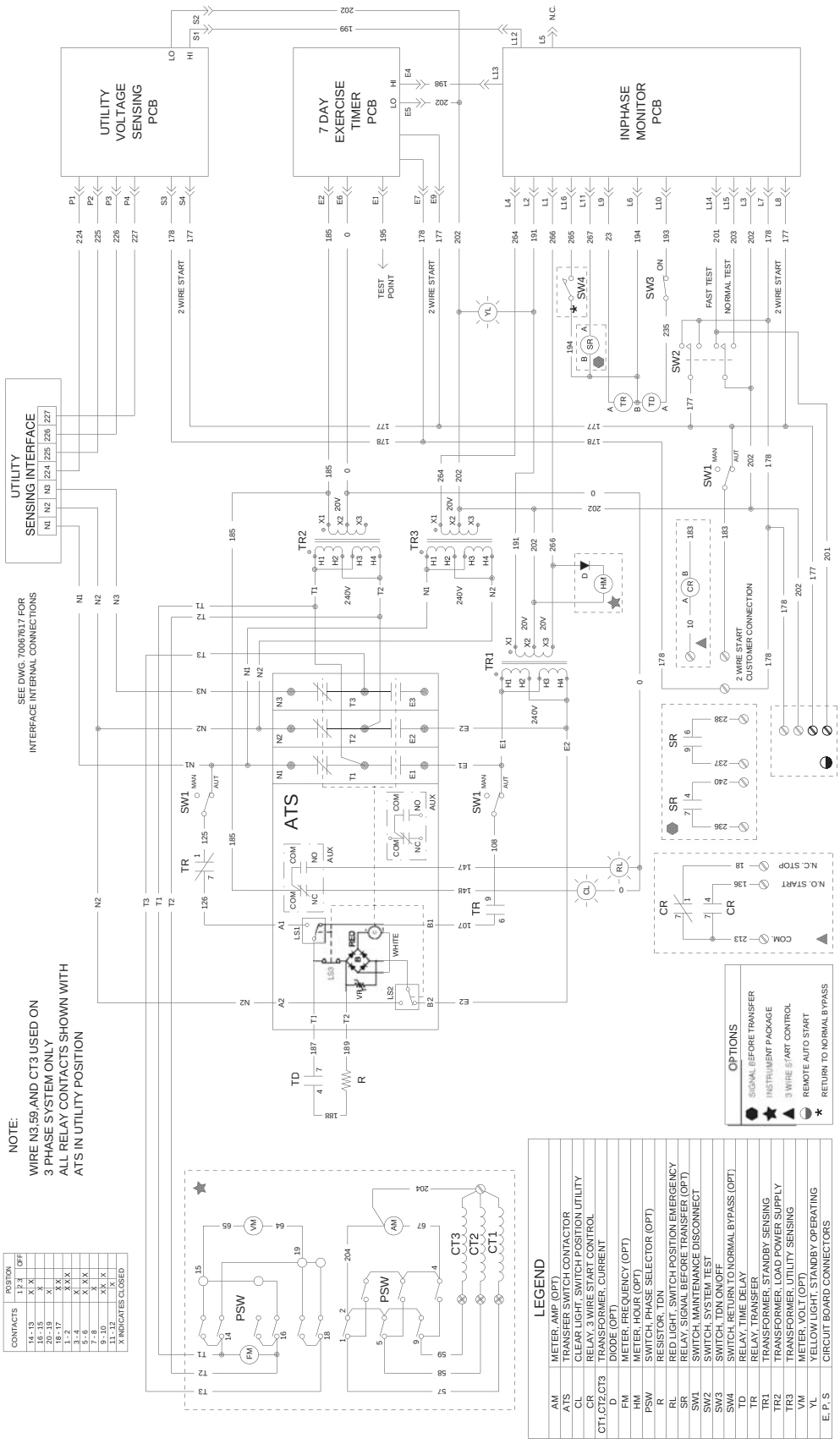


200-400 Amp NEMA 12 Units With Instrument Package



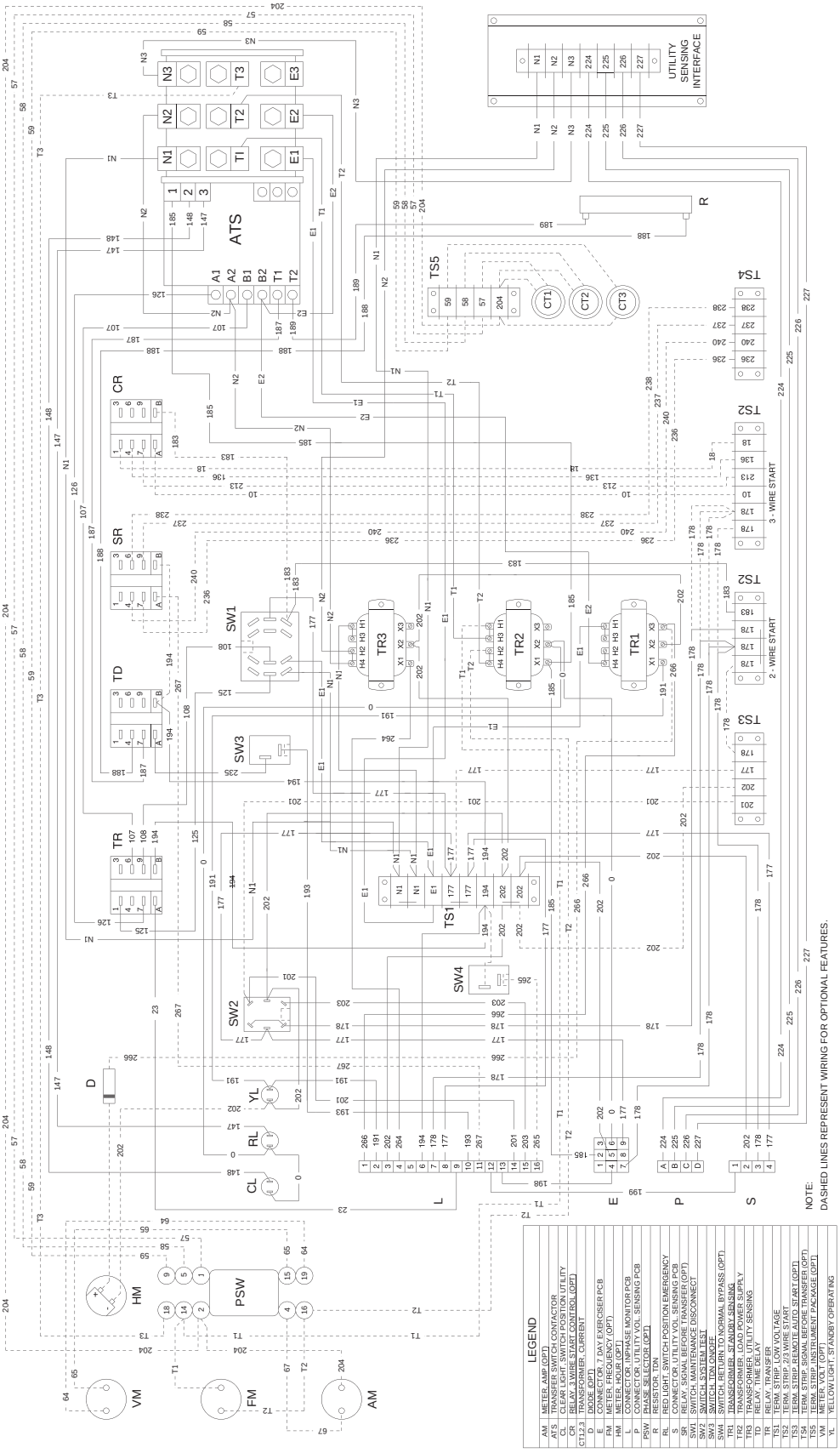
Olympian "Y" Type Transfer Switch

Electrical Schematic - 240V Transfer Switch - Drawing No. 91286



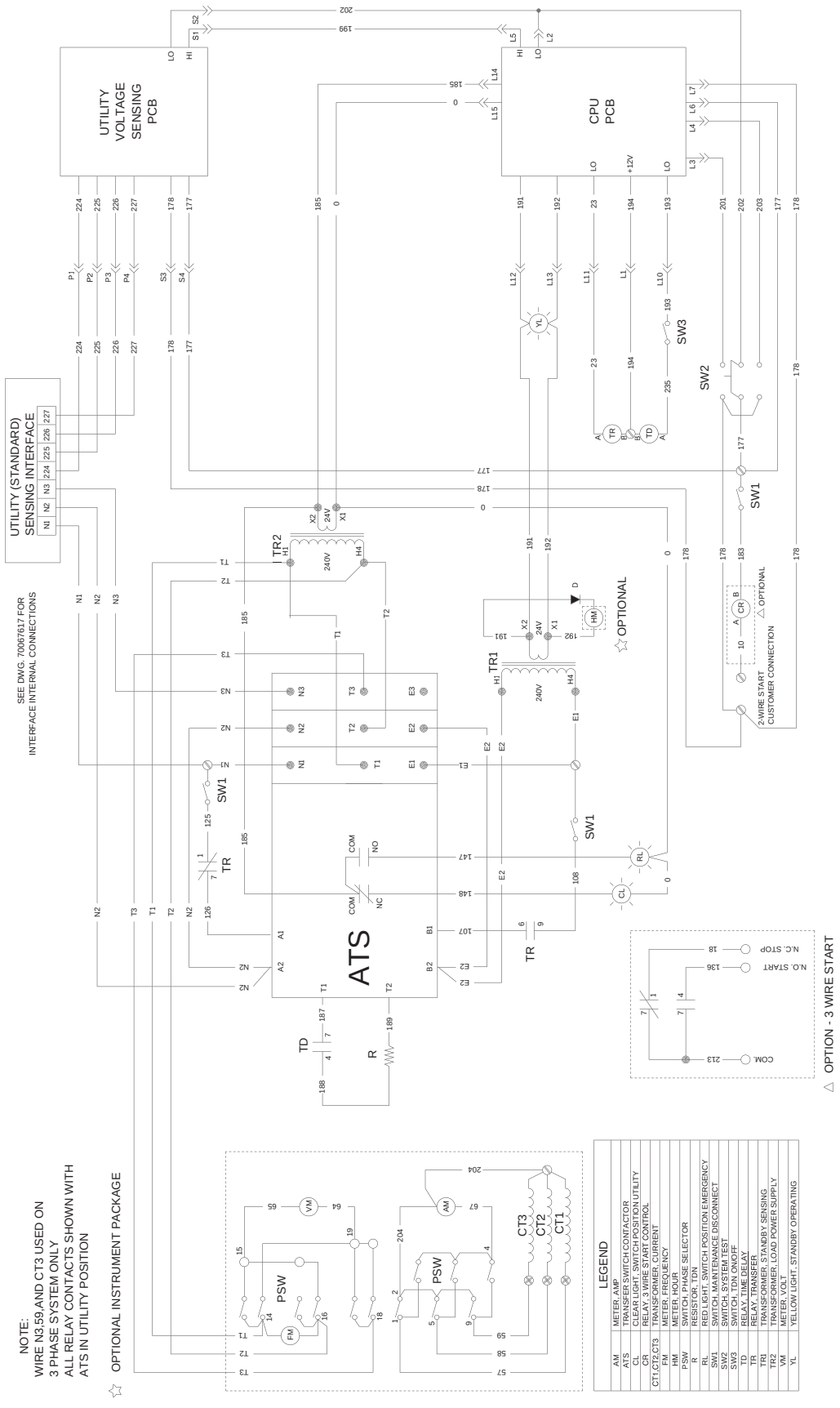
Olympian "Y" Type Transfer Switch

Wiring Diagram - 240V Transfer Switch - Drawing No. 91397-A



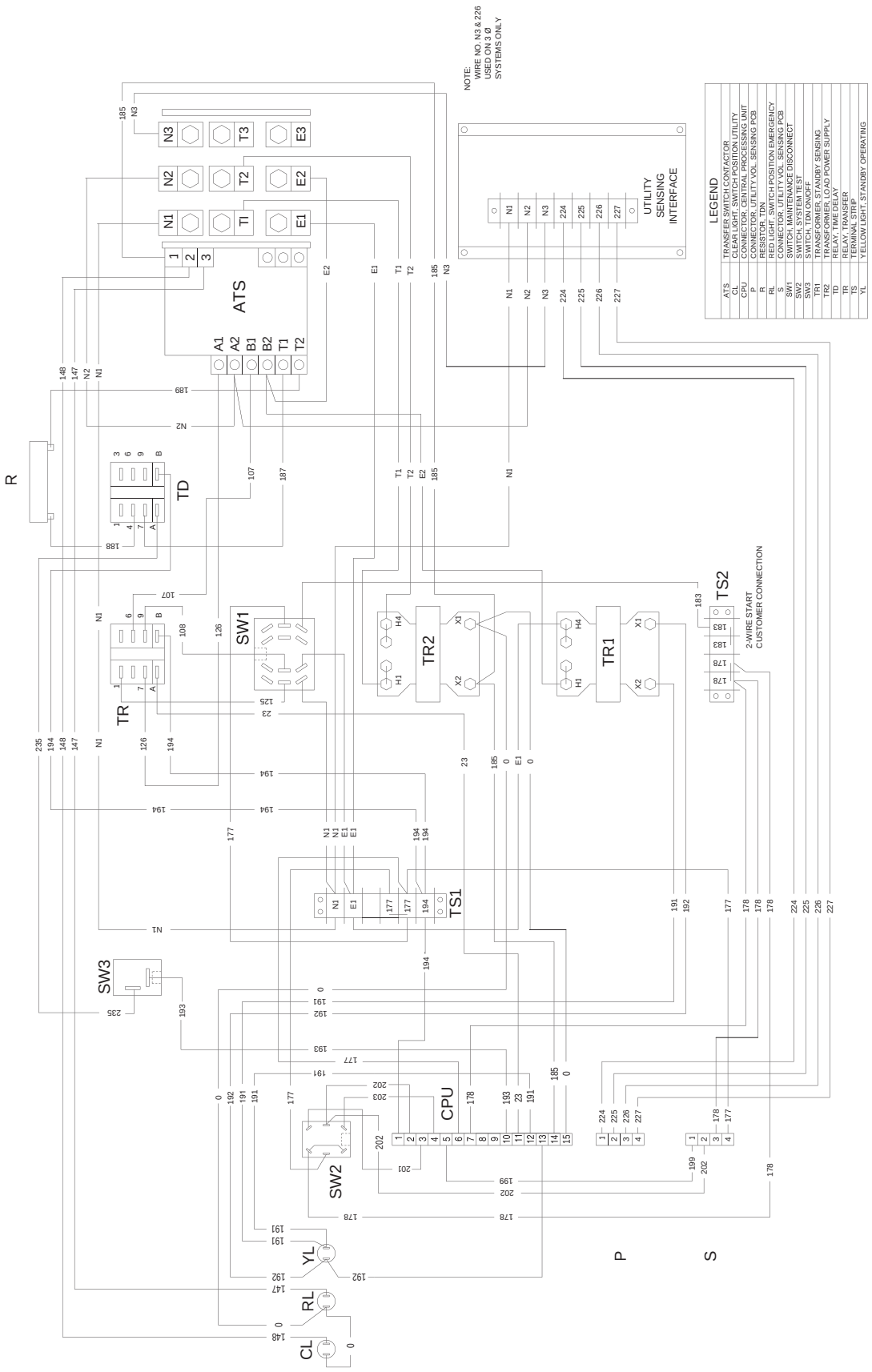
Olympian "Y" Type Transfer Switch

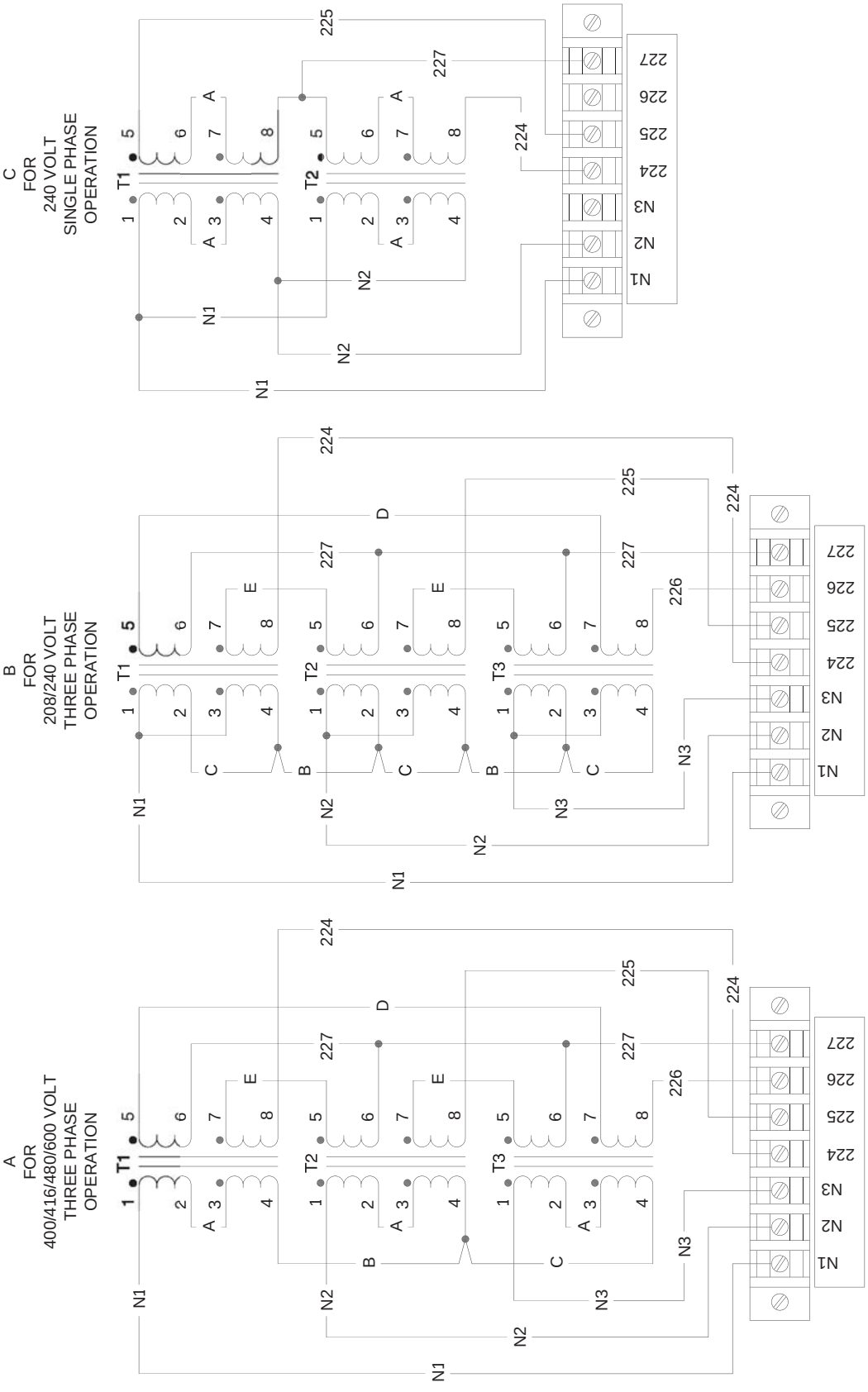
Electrical Schematic - 240V Transfer Switch - Drawing No. 75017



Olympian "Y" Type Transfer Switch

Wiring Diagram - 105-420A Transfer Switch - Drawing No. 74699

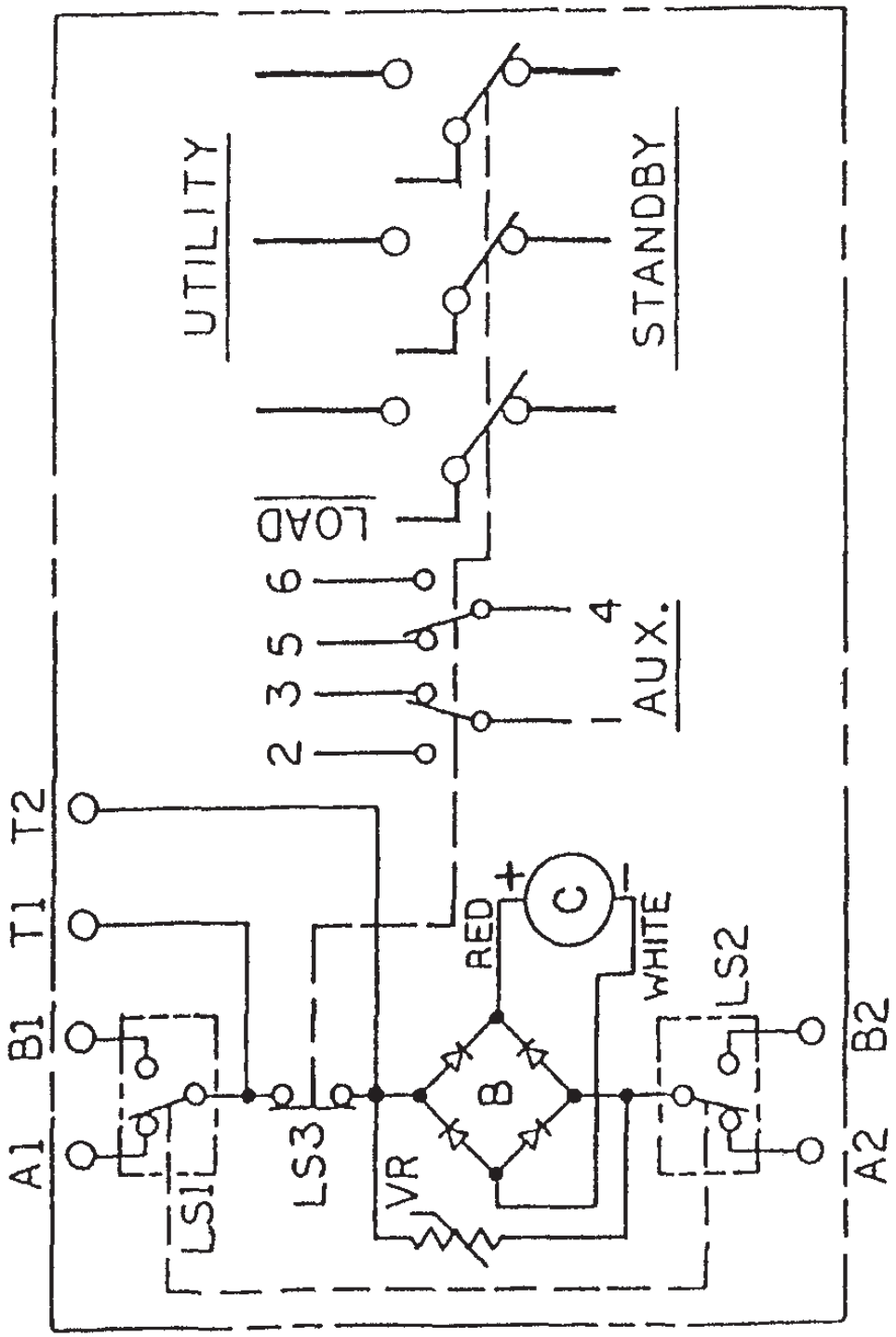


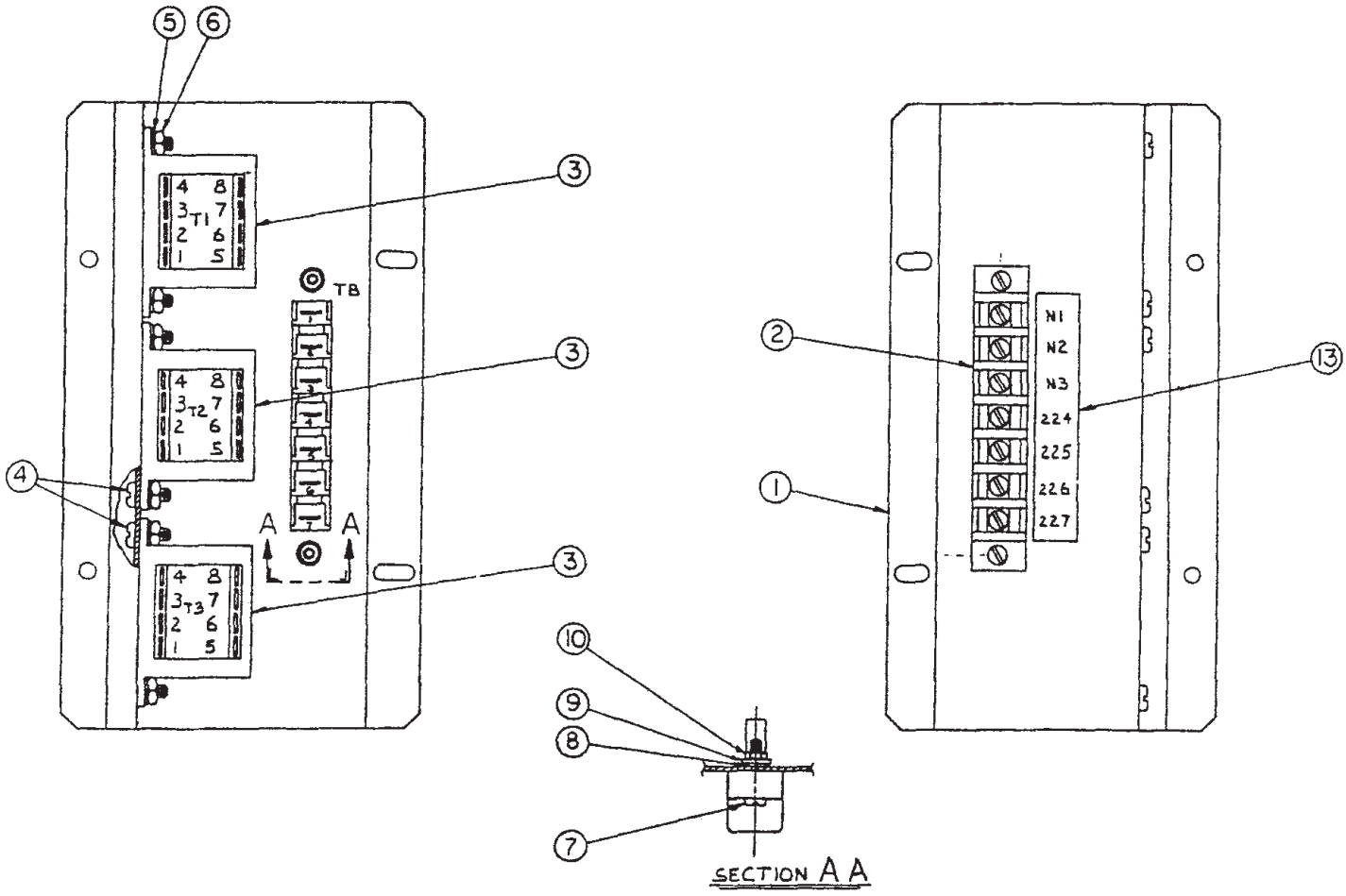

A
FOR
400/416/480/600 VOLT
THREE PHASE
OPERATION
B
FOR
208/240 VOLT
THREE PHASE
OPERATION
C
FOR
240 VOLT
SINGLE PHASE
OPERATION
T1
T2
T3
N1
N2
N3
224
225
226
227

Olympian "Y" Type Transfer Switch

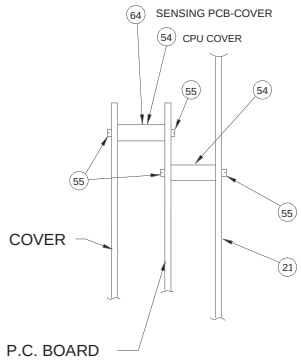
Electrical Schematic - Drawing No. 63373

Legend
B = Bridge Rectifier
C = Solenoid Coil
LS1, LS2 = Limit Switch (Switch Operation)
LS3 = Limit Switch (Neutral Position)
VR = Varistor





ITEM	PART NO.	QTY.	DESCRIPTION
1	20A67621	1	BRACKET, TRANSFORMER MOUNTING
2	20A67615	1	BLOCK, TERMINAL
3	20A67614	3	TRANSFORMER, DUAL
4	33514	6	SCREW, PAN HEAD MACHINE - NO. 8-32 X 1/2"
5	22264	6	LOCKWASHER, NO. 8
6	22471	6	NUT, HEX - NO. 8-32
7	33502	2	SCREW, PAN HEAD MACHINE - NO. 6-32 X 3.4"
8	22155	2	LOCKWASHER, NO.6
9	22985	2	FLATWASHER, NO.6
10	22188	2	NUT, HEX - NO. 6-32
12	55199-A	6 FT.	WIRE, INSULATED - NO 18 AWG. (TEW)
13	20A67931	1	DECAL, INTERFACE



P.C. BOARD INSTALLATION

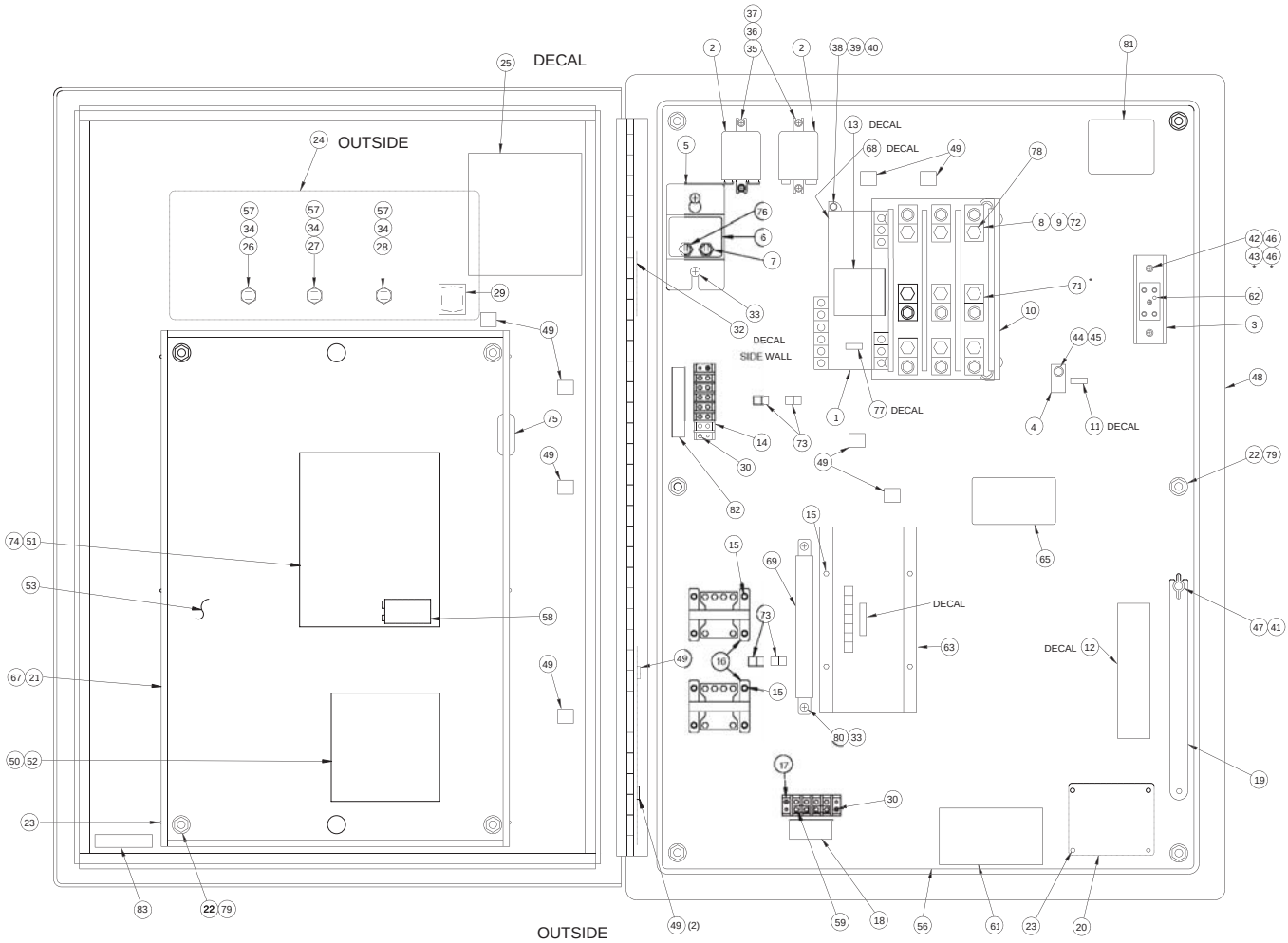
TYPICAL

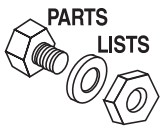
LUG TO SWITCH STUD TORQUE SPEC.

OUTSIDE LUGS 110-115 IN-LB

INSIDE LUGS 80-85 IN-LB

* 200,300,420 AMP 3-POLE SWITCH

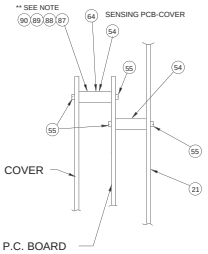




ITEM	PART NO.	QTY.	DESCRIPTION
1	63302	1	TRANSFER SWITCH-105A, 2-POLE
	62642	1	TRANSFER SWITCH-105A, 3-POLE
	63597	1	TRANSFER SWITCH-105A, 4-POLE
	63312	1	TRANSFER SWITCH-150A, 2-POLE
	62643	1	TRANSFER SWITCH-150A, 3-POLE
	63599	1	TRANSFER SWITCH-150A, 4-POLE
	62677	1	TRANSFER SWITCH-200A, 2-POLE
	64198	1	TRANSFER SWITCH-200A, 3-POLE
	63598	1	TRANSFER SWITCH-200A, 4-POLE
	62645	1	TRANSFER SWITCH-300A, 2-POLE
	62646	1	TRANSFER SWITCH-300A, 3-POLE
	64100	1	TRANSFER SWITCH-300A, 4-POLE
	62647	1	TRANSFER SWITCH-420A, 2-POLE
	62648	1	TRANSFER SWITCH-420A, 3-POLE
	64344	1	TRANSFER SWITCH-420A, 4-POLE
2	63617	2	RELAY, TRANSFER
3	63384	1	LUG, NEUTRAL-105 & 150 A SWITCH
	63657	1	LUG, NEUTRAL-200 & 300 A SWITCH
	62633	1	LUG, NEUTRAL-420 A SWITCH
4	62684	1	LUG, GROUNDING-105 & 150A SWITCH
	57329	1	LUG, GROUNDING-200, 300 & 420A SWITCH
5	74509	1	BRACKET, SAFETY DISCONNECT SWITCH
6	74511	1	DECAL, SAFETY DISCONNECT SWITCH
7	55868	1	SWITCH, SAFETY DISCONNECT-4PDT
8	99084	-	LUG-105 & 150A SWITCH (3 PER HOLE)
	62704	-	LUG-200 & 300 SWITCH (2 PER HOLE)
	62705	-	LUG 400A SWITCH (2 PER HOLE)
9	21591	1	LUG ADAPTOR PLATE (1 PER HOLE FOR EACH 100A SWITCH USED ON CENTER LUG)
	21591	3	LUG ADAPTOR PLATE (3 PER HOLE FOR EACH 150A SWITCH)
10	64109-A	1	COVER-105 & 150A, 2-POLE SWITCH
	64109-B	1	COVER-105 & 150A, 3-POLE SWITCH
	64109-C	1	COVER-105 & 150A, 4-POLE SWITCH
	64109-G	1	COVER-200, 300 & 420A, 2-POLE SWITCH
	64109-H	1	COVER-200, 300 & 420A, 3-POLE SWITCH
	64109-I	1	COVER-200, 300 & 420A, 4-POLE SWITCH
11	67210-A	1	DECAL, GROUND
12	74525	1	DECAL, MANUAL OPERATION
13	74510-A	1	DECAL, 105A TRANSFER SWITCH
	74510-B	1	DECAL, 150A TRANSFER SWITCH
	74510-C	1	DECAL, 200A TRANSFER SWITCH
	74510-D	1	DECAL, 300A TRANSFER SWITCH
	74510-E	1	DECAL, 420A TRANSFER SWITCH
14	46357	1	BLOCK, TERMINAL - 6 POSITION
15	56893	12	#10-24 X 1/2" CRIMPTITE
16	47616	2	TRANSFORMER
17	46689	1	BLOCK, TERMINAL - 4 POSITION
18	63580	1	DECAL, TERMINAL BLOCK
19	63321	1	HANDLE, MANUAL TRANSFER
20	63578	1	PLATE, DATA
21	68212	1	COMPARTMENT, PRINTED CIRCUIT BOARD
22	64101	10	3/8"-16 FLANGED LOCK NUT
23	36261	10	POP RIVET
24	73681	1	DECAL, GTS
	56298	1	DECAL, GENERAC NEMA 3R ONLY
	90257	1	DECAL, OLYMPIAN NEMA 3R ONLY
	87227	1	DECAL, OLYMPIAN
25	63385	1	DECAL, AUTOMATIC SEQUENCE
26	57328	1	LENS, LAMP - CLEAR
27	57327	1	LENS, LAMP - RED
28	57325	1	LENS, LAMP - YELLOW
29	55142	1	SWITCH, MODE - DPDT
30	A1661	4	POP RIVET
32	63595-A	1	DECAL, TESTING SEQUENCE 105 & 150A
	63595-B	1	DECAL, TESTING SEQUENCE 200 & 300A
	63595-C	1	DECAL, TESTING SEQUENCE 420A
33	A2111	4	#10-32 X 5/16" FASTENER
34	57514	3	HOLDER, LAMP
35	38150	4	#8 FLAT WASHER
36	A2284	4	#8-32 X 1/2" FASTENER
37	22264	4	#8 LOCK WASHER
38	90388	3	M6-1.0 X 12 TAPTITE
39	49811	3	M6 FLAT WASHER
40	22097	3	M6 LOCK WASHER
41	58000-L	1	M6-1.0 TRIC-NUT
42	A2312	2	#10-32 X 1" FASTENER
43	A2311	2	1/4"-20 X 1" SCREW
44	24526	1	5/16-18 X 3/4" TAPTITE
45	22129	1	5/16" LOCK WASHER
46	22678	1CC	LOC-TITE (TYPE A)
47	64133	1	STUD (INCLUDES WING NUT)
48	63558	1	ENCLOSURE 100-150A SWITCH (INSTRUMENT PACKAGE)
	73959	1	ENCLOSURE 100-150A SWITCH (NEMA 12)
	73961	1	ENCLOSURE 100-150A SWITCH (NEMA 1)
	73961-C	1	ENCLOSURE 100-150A SWITCH (NEMA 3R)
	63559	1	ENCLOSURE 200-420A SWITCH (INSTRUMENT PACKAGE)
	73960	1	ENCLOSURE 200-420A SWITCH (NEMA 12)
	73962	1	ENCLOSURE 200-420A SWITCH (NEMA 1)
	73962-C	1	ENCLOSURE 200-420A SWITCH (NEMA 3R)
49	57593	13	TIE-DOWN, CABLE
50	67629	1	BOARD, UTIL. VOLT. SENS. -MULTI VOLTAGE
51	67626	1	BOARD, SYSTEM CONTROL (CPU)
52	20A67616	1	COVER, UTILITY VOLT. SENSING BOARD
53	63582	1	DOOR, PRINTED CIR. BRD COMPARTMENT
54	64525	12	SUPPORT, PRINTED CIRCUIT BOARD
55	64526	32	#6-32 X 3/8" SELF-TAPPING SCREW
56	64152	1	SUBPLATE - 105 & 150A SWITCH
	63655	1	SUBPLATE - 200, 300 & 420A SWITCH
57	40587	3	LAMP, 28 VOLTS
58	63998	1	BATTERY, 9 VOLTS
59	46669	2	JUMPER, TERMINAL BLOCK
60	72956	-	HARNESS, WIRING-105 & 150A SW. (NOT SHOWN)
	73957	-	HARNESS, WIRING 200, 300 & 420A SW. (NOT SHOWN)
61	62209	1	DECAL, UL
62	26902	1	#8-32 X 1/4" TAPTITE (105 & 150A SWITCH ONLY)
63	30B61617	1	INTERFACE, UTILITY (208/240 V 3-PHASE)
	86961	1	INTERFACE, UTILITY (240 V 1-PHASE)
64	68337	4	STAND-OFF, HEX 1" LG. (STANDARD SENSING ONLY)
65	54199	1	DECAL, HIGH VOLTAGE
66	64761	-	TIE WRAP, 5 5/8" LG. (NOT SHOWN)
67	63981	2	GUIDE, SIDE
68	63357	1	DECAL, MAC DT GTS
69	63971	1	RESISTOR-250 OHM, 100 WATT
71	62702	-	LUG, TERM. 200 & 300A SW. ONLY (1 PER POLE REQ.)
	62703	-	LUG, TERM. 420A SW. ONLY (1 PER POLE REQ.)
72	26902	-	#8-32 X 1/4" TAPTITE
73	63378	4	TIE-DOWN, CABLE
74	71775	1	COVER, CPU
75	72252	1	GROMMET
76	28199	1	SWITCH, TIME DELAY NEUTRAL BYPASS
	74514-A	1	SWITCH P/N 63302
	74514-B	1	SWITCH P/N 62642
	74514-C	1	SWITCH P/N 63597
	74514-D	1	SWITCH P/N 63312
	74514-E	1	SWITCH P/N 62643
	74514-F	1	SWITCH P/N 63599
	74514-G	1	SWITCH P/N 62677
	74514-J	1	SWITCH P/N 64198
	74514-K	1	SWITCH P/N 63598
	74514-L	1	SWITCH P/N 62645
	74514-M	1	SWITCH P/N 62646
	74514-N	1	SWITCH P/N 64100
	74514-P	1	SWITCH P/N 62647
	74514-R	1	SWITCH P/N 62647
	74514-S	1	SWITCH P/N 64344
78	67989	18	M8-1.25 LOCK FLANGE NUT
79	22131	10	3/8" FLAT WASHER
80	63324	2	MOUNTING BRACKET, RESISTOR
81	64510	1	DECAL, TERMINAL NOTE
82	64110	1	DECAL, TERMINAL STRIP LOW VOLTAGE
83	77228	1	DECAL, ENCLOSURE NOTE

Olympian "Y" Type Transfer Switch

105-420A Inphase Assembly - Drawing No. 91392-C



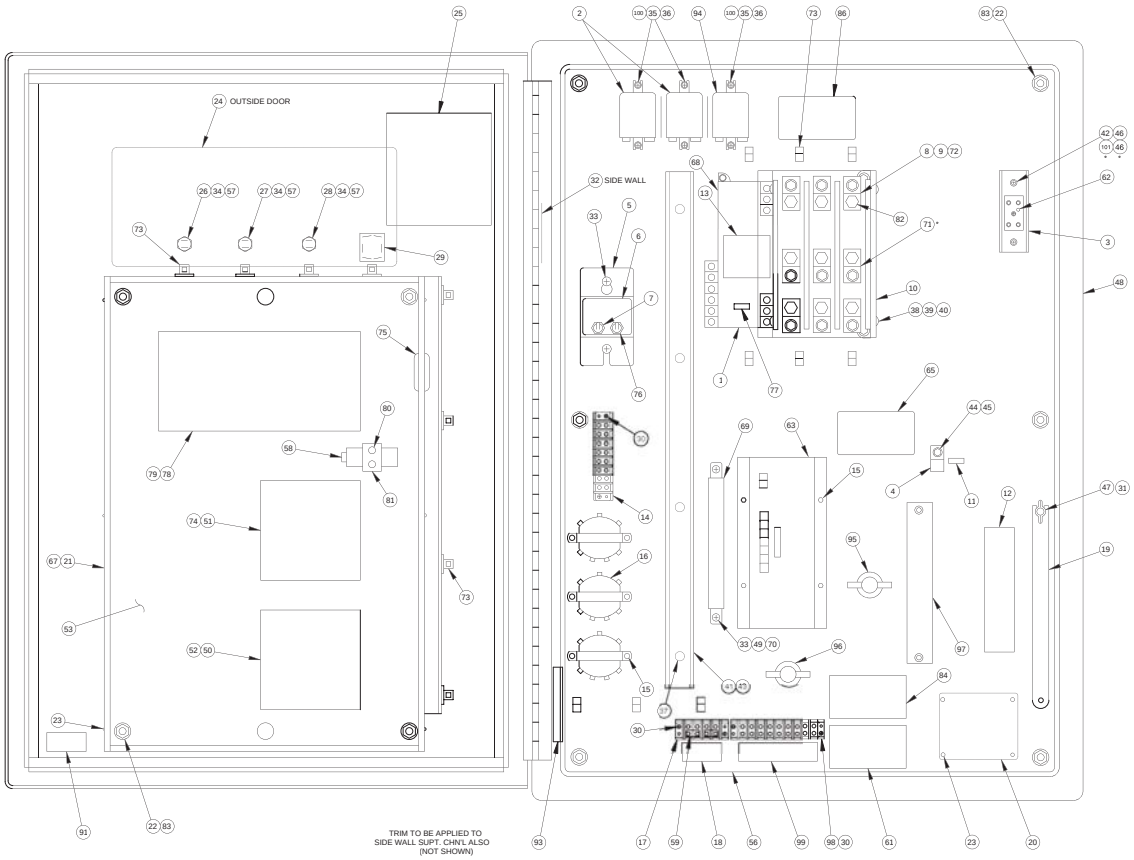
P.C. BOARD INSTALLATION
TYPICAL

LUG TO SWITCH STUD TORQUE SPEC.

OUTSIDE LUGS 110-115 IN-LB
INSIDE LUGS 80-85 IN-LB

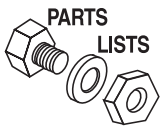
* 200,300,420 AMP 3-POLE SWITCH

** USED ONLY WITH #63919 BOARD



ITEM	PART NO.	QTY.	DESCRIPTION
1	63302	1	TRANSFER SWITCH-105A, 2-POLE
	62642	1	TRANSFER SWITCH-105A, 3-POLE
	63597	1	TRANSFER SWITCH-105A, 4-POLE
	63312	1	TRANSFER SWITCH-150A, 2-POLE
	62643	1	TRANSFER SWITCH-150A, 3-POLE
	63599	1	TRANSFER SWITCH-150A, 4-POLE
	62677	1	TRANSFER SWITCH-200A, 2-POLE
	64198	1	TRANSFER SWITCH-200A, 3-POLE
	63598	1	TRANSFER SWITCH-200A, 4-POLE
	62645	1	TRANSFER SWITCH-300A, 2-POLE
	62646	1	TRANSFER SWITCH-300A, 3-POLE
	64100	1	TRANSFER SWITCH-300A, 4-POLE
	62647	1	TRANSFER SWITCH-420A, 2-POLE
	62648	1	TRANSFER SWITCH-420A, 3-POLE
	64344	1	TRANSFER SWITCH-420A, 4-POLE
2	63617	2	RELAY, TRANSFER

ITEM	PART NO.	QTY.	DESCRIPTION
3	63384	1	LUG, NEUTRAL - 105 & 150A SWITCH
	63657	1	LUG, NEUTRAL - 200 & 300A SWITCH
	62633	1	LUG, NEUTRAL - 420A SWITCH
4	62684	1	LUG, GROUNDING-105 & 150A SWITCH
	57329	1	LUG, GROUNDING-200, 300 & 420A SWITCH
5	74509	1	BRACKET, SAFETY DISCONNECT SWITCH
6	74511	1	DECAL, SAFETY DISCONNECT SWITCH
7	55868	1	SWITCH, SAFETY DISCONNECT-4PDT
8	99084	-	LUG-105 & 150A SWITCH (3 PER HOLE)
	62704	-	LUG-200 & 300A SWITCH (2 PER HOLE)
	62705	-	LUG 400A SWITCH (2 PER HOLE)
9	21591	1	LUG ADAPTOR PLATE (1 PER HOLE FOR EACH 100A SWITCH USED ON CENTER LUG)



ITEM	PART NO.	QTY.	DESCRIPTION
		3	LUG ADAPTOR PLATE (3 PER HOLE FOR EACH 150A SWITCH)
10	64109-A	1	COVER-105-150A, 2-POLE SWITCH
	64109-B	1	COVER-105-150A, 3-POLE SWITCH
	64109-C	1	COVER-105-150A, 4-POLE SWITCH
	64109-G	1	COVER-200-420A, 2-POLE SWITCH
	64109-H	1	COVER-200-420A, 3-POLE SWITCH
	64109-I	1	COVER-200-420A, 4-POLE SWITCH
11	67210-A	1	DECAL, GROUND
12	85636	1	DECAL, MANUAL OPERATION
13	74510-A	1	DECAL, 105A TRANSFER SWITCH
	74510-B	1	DECAL, 150A TRANSFER SWITCH
	74510-C	1	DECAL, 200A TRANSFER SWITCH
	74510-D	1	DECAL, 300A TRANSFER SWITCH
	74510-E	1	DECAL, 420A TRANSFER SWITCH
14	57701	1	BLOCK TERMINAL - 8 POS.
15	56893	10	SCR., CRIMPTITE #10-24 X 1/2"
16	90975	3	TRANSFORMER - 25VA
17	46689	1	BLOCK, TERMINAL - 4 POS.
18	91466	1	DECAL, TERMINAL BLOCK
19	63321	1	HANDLE, MANUAL TRANSFER
20	63578	1	PLATE, DATA
21	68212	1	COMPARTMENT, PRINTED CIRCUIT BOARD
22	64101	10	NUT, FLANGED LOCK 3/8"-16
23	36261	10	RIVET, POP 1/8" X .23" SS
24	73681	1	DECAL, GTS
	56298	1	DECAL GRS NEMAL 3R ENCLOSURE
	90257	1	DECAL, CTS NEMA 3R ENCLOSURE
	87227	1	DECAL, CTS
25	91478	1	DECAL, AUTOMATIC SEQUENCE
26	57328	1	LENS, LAMP CLEAR
27	57327	1	LENS, LAMP RED
28	57325	1	LENS, LAMP YELLOW
29	55142	1	SWITCH, MODE DPDT
30	A1661	6	RIVET, POP .156 D X .5 LG.
31	58000-L	1	TRIC-NUT M6 X 1.0 THD.
32	63595-A	1	DECAL, TESTING SEQUENCE 105, 150A
	63595-B	1	DECAL, TESTING SEQUENCE 200, 300A
	63595-C	1	DECAL, TESTING SEQUENCE 420A
33	A2111	4	10-32 - 5/16 FASTENER
34	57514	3	HOLDER, LAMP
35	38150	6	WASHER, FLAT #8
36	A2284	6	8-32 X 1/2" FASTENER
37	91477	5	RIVET, NYLON "PUSH"
38	90388	3	M6-1.0 X 12 TAPTITE
39	49811	3	WASHER, FLAT M6
40	22097	3	WASHER, LOCK M6
41	91472	1	DUCT, WIRE 24 1/4" LG.
	91472	1	DUCT, WIRE 33 1/2" LG.
42	A2312	2	10-32 - 1" FASTENER
43	91472-A	1	COVER, WIRE DUCT 24 1/4" LG.
	91472-A	1	COVER, WIRE DUCT 33 1/2" LG.
44	24526	1	SCR., TAPTITE 5/16" - 18 X 3/4"
45	22129	1	WASHER, LOCK 5/16"
46	22678	1 CC	LOCK-TITE (TYPE A)
47	64113	1	STUD (INCLUDES WING NUT)
48	63558	1	ENCLOSURE, 105-150 AMP INST. PKG.
	73959	1	ENCLOSURE, 105-150 AMP NEMA 12
	73961	1	ENCLOSURE 105-150 AMP NEMA 1
	73961-C	1	ENCLOSURE 105-150 AMP NEMA 3R
	63559	1	ENCLOSURE, 200-420 AMP INST. PKG.
	73960	1	ENCLOSURE, 200-420 AMP NEMA 12
	73962	1	ENCLOSURE, 200-420 AMP NEMA 1
	73962-C	1	ENCLOSURE, 200-420 AMP NEMA 3R
49	63324	2	BRACKET, RESISTOR MTG.
50	67629	1	BRD., UTIL. VOLT. SENS. MULTI-VOLT
51	64217	1	BOARD, CIRCUIT EXERCISER (STD.)
	63919	1	BOARD, CIRCUIT EXERCISER (DELUXE)
52	20A67616	1	CVR., UTIL. VOLT SENS. BOARD
53	63582	1	DOOR, PRINTED CIRCUIT BRD. COMPT.
54	64525	12	SUPPORT, PRINTED CIRCUIT BOARD
55	64526	36	SCR., TAPTITE #6-32 X 3/8"
56	64152	1	SUBPLATE, 105-150 AMP SWITCH
	63655	1	SUBPLATE, 200-420 AMP SWITCH
57	40587	3	LAMP, 28 VOLT
58	63998	1	BATTERY, 9 VOLT
59	46669	2	JUMPER, TERMINAL BLOCK
60	72956	-	HARNESS-WRG 105-150A SW (NOT SHOWN)
	73957	-	HARNESS-WRG 200-400A SW (NOT SHOWN)
61	62209	1	DECAL, UL
62	26902	1	SCR. TAPTITE #8-32 X 1/4" 105-150A SW
63	30B67617	1	INTERFACE, UTILITY 208/240V 3-PHASE
	86961	1	INTERFACE, UTILITY 240V 1-PHASE
64	68337	4	STANDOFF, HX SPCR 1.0"L (STD SENS.)
65	54199	1	DECAL, HIGH VOLTAGE
66	64761	-	TIE-WRAP, 5 5/8" LG (NOT SHOWN)
67	63981	2	GUIDE, SIDE
68	63357	1	DECAL, MAC DT GTS
69	63971	1	RESISTOR, 250 OHM 100 WATT
70	22152	2	WASHER, LOCK #10
71	62702	-	LUG, TERM 200-300A SW (1-POLE REQD)
	62703	-	LUG, TERM 420A SW (1-POLE REQD)
72	26902	-	SCR., TAPTITE #8-32 X 1/4"
73	63378	31	TIE-DOWN, CABLE
74	63996	1	CVR, EXERCISER CIRCUIT BRD. (STD.)
	64298	1	CVR, EXERCISER CIRCUIT BRD. (DLX.)
75	72252	1	GROMMET
76	28199	1	SWITCH, TIME DELAY NEUTRAL BYPASS
77	74514-A	1	SWITCH PART #63302
	74514-B	1	SWITCH PART #62642
	74514-C	1	SWITCH PART #63597
	74514-D	1	SWITCH PART #63312
	74514-E	1	SWITCH PART #62643
	74514-F	1	SWITCH PART #63599
	74514-G	1	SWITCH PART #62677
	74514-J	1	SWITCH PART #64198
	74514-K	1	SWITCH PART #63598
	74514-L	1	SWITCH PART #62645
	74514-M	1	SWITCH PART #62646
	74514-N	1	SWITCH PART #64100
	74514-P	1	SWITCH PART #62647
	74514-R	1	SWITCH PART #64344
	74514-S	1	SWITCH PART #64344
78	88019	1	PCB, IN-PHASE MONITOR
79	91434	1	COVER, IN-PHASE CONTROL
80	29357	2	RIVET
81	63982	2	CLIP, BATTERY
82	67989	9	NUT, FLANGED LOCK M8-1.25
83	22131	10	WASHER, FLAT 3/8"
84	83736	1	DECAL, CSA
86	64510	1	DECAL, TERMINAL NOTE
87	33139	4	SCR., HEX HD. MACH. #6-32 X 3/4"
88	22188	4	NUT, HEX #6-32
89	22155	4	LOCKWASHER, #6
90	64210	4	TUBE, NYLON Ø .17 X .43
91	77228	1	DECAL, ENCLOSURE TYPE
92	64153-A	4	WIRE, XFORMER JUMPER (NOT SHOWN)
93	56326	2	TRIM, VINYL 1/8" GAP X 7.0 LG.
	56326	1	TRIM, VINYL 1/8" GAP X 9 1/8" LG.
94	71315	1	RELAY FL MT - 10A 240 VAC
95	51576	1	THERMOSTAT, 20-40 DEG.
96	51576A	1	KLIXON T-STUT 3/16
97	61170	1	STRIP HEATER 150 WATT
98	61520	1	TERMINAL BLOCK 9 PT
99	97597	1	DECAL, TERMINAL STRIP GTS
100	22264	6	WASHER, LOCK #8
101	A2311	2	1/4-20-1, SCREW

STANDARD ONE YEAR LIMITED WARRANTY FOR OLYMPIAN™ TRANSFER SWITCHES

For a period of 1 (one) year from the date of original sale, an Olympian™ dealer will, at its option, repair or replace any part(s) which, upon examination, inspection, and testing by an Olympian™ dealer, is found to be defective under normal use and service. Any equipment that the purchaser/owner claims to be defective must be examined by the nearest Olympian™ dealer's authorized warranty service facility. All transportation costs under the warranty, including return to the factory, are to be borne and prepaid by the purchaser/owner.

WARRANTY SCHEDULE

- **YEAR ONE** — 100% (one hundred percent) coverage of on-site labor and parts listed.
- **TRANSFER SYSTEM** — All Components.

All warranty expense allowances are subject to the conditions defined in the published GENERAC POLICIES AND PROCEDURES MANUAL.

* Rental units and demonstrators are warranted for 90 days. Rental units and demonstrators which are resold **are not** covered under the Olympian™ Generators warranty.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

1. Costs of normal maintenance i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up.
2. Failures due, but not limited to, normal wear and tear, accident, misuse, abuse, negligence, or improper installation or sizing.

This warranty is effective for all products manufactured after October 18, 1984, and supersedes all prior warranties of Olympian™ Generators.

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, SPECIFICALLY, OLYMPIAN™ GENERATORS MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

OLYMPIAN™ GENERATORS ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL OLYMPIAN™ GENERATORS BE LIABLE FOR ANY INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF OLYMPIAN™ GENERATORS NEGLIGENCE.

Purchaser/owner agrees to make no claims against Olympian™ Generators based on negligence.

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