GENERAC®

TTS Series

TMS-200

200A Manual Transfer Switch Owner's Manual

Only qualified electricians or contractors should attempt installation!

Model 006301-0	**120/240V, 1-phase**
Model 006303-0	**120/208V, 3-phase**
	120/240V, 3-phase

This manual should remain with the unit.

Table of Contents

⚠ DANGER!

⚠ 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 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.

The manufacturer cannot anticipate every possible circumstance 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 using a procedure, work method or operating technique the manufacturer does not specifically recommend, ensure that it is safe for others. Also make sure the procedure, work method or operating technique chosen does not render the transfer switch unsafe.

WARNING!

California Proposition 65

Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

WARNING!

California Proposition 65

This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm.

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions 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, read instructions that, if not strictly complied with, will result in serious personal injury, including death.

⚠ WARNING!

After this heading, read instructions that, if not strictly complied with, could result in serious personal injury, including death.

⚠ CAUTION!

After this heading, read instructions that, if not strictly complied with, might result in minor or moderate injury.

NOTE:

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

SAFETY RULES

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.

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.
- Remove all jewelry (such as rings, watches, bracelets, etc.) before working on this equipment.
- If work must be done 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 dry 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. Then place a "DO NOT OPERATE" tag on the transfer switch and on the generator. Remove the Negative (Neg) or (–) black battery cable.

1.1 INTRODUCTION

This manual has been prepared especially for the purpose of familiarizing personnel with the design, application, installation and operation of the applicable equipment. Read this 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. The manufacturer, however, reserves the right to change, alter or otherwise improve the product at any time without prior notice.

1.2 EQUIPMENT DESCRIPTION

The Telecom Transfer Switch (TMS) is a combination of individual components that perform three basic functions.

This switch is suitable for control of motors, electric discharge lamps, electric heating equipment and tungsten filament loads that do not exceed 30% of the switch rating.

This UL listed transfer switch is used for optional standby systems only (NEC 702). Additional ratings are on the decals attached to the inside of the enclosure door.

1.2.1 MANUAL TRANSFER SWITCH

This unit is equipped with a manual transfer switch mechanism that is comprised of two (2) circuit breakers. The load terminals of each breaker are connected together to supply the load. A mechanical, sliding bar interlock is provided to isolate the 2 sources of supply. This transfer switch mechanism is used for transferring the customer load between the NORMAL (UTILITY) power source and the Generator supply connected to the Cam-Lok™ connectors (Figure 1).

This device is suitable for use as service equipment.

Customer connections. Refer to the installation diagram for location and wire size capacity. All lugs are rated for copper or aluminum wire.

The manual transfer switch can be accessed from the door on the front of the enclosure.

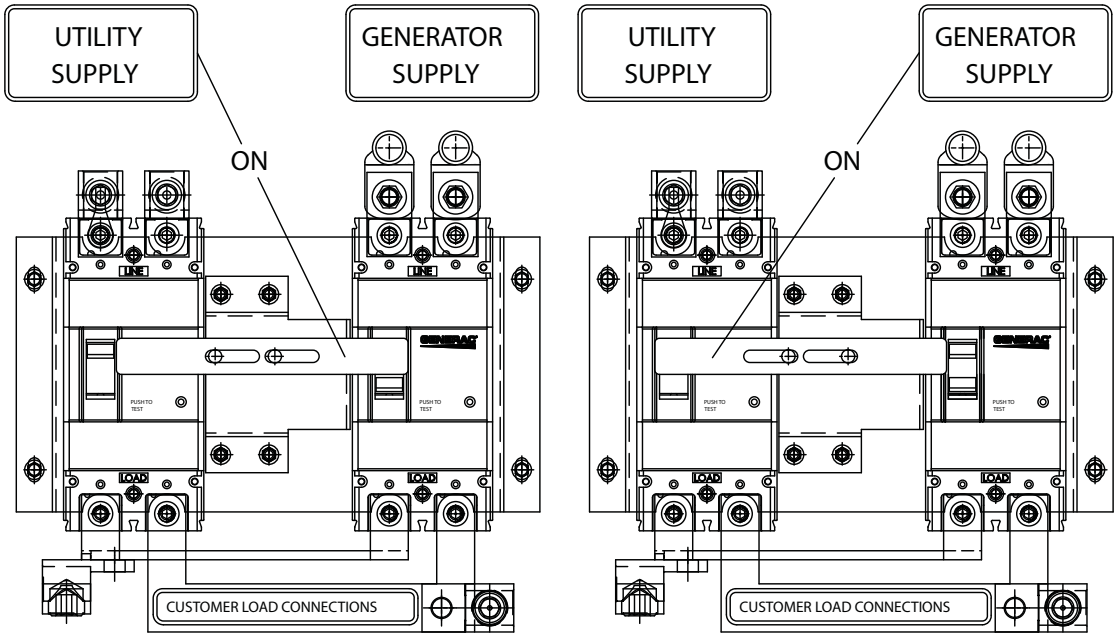
1.2.2 CAM-LOK™ CONNECTION

Individual Cam-Lok™ connectors are provided for the engine generator output connection to the transfer switch mechanism. Cam-Lok™ connectors can be accessed by opening the door on the bottom of the enclosure. A padlockable, quarter-turn latch is provided to keep door closed when the cables are not connected. A slot is provided in the bottom door to allow the annuciator cable from the generator to pass through when the generator main cables are disconnected and the access door is closed. An individual connector is provided for each ungrounded conductor, neutral and ground. (4) single-phase and (5) three-phase.

1.2.3 ANNUNCIATOR

This unit is equipped with an annuciator connection from the generator. A quick connect connector is mounted adjacent to the Cam-Lok™ connectors. This connector is terminated inside the enclosure on a multi position barrier strip. Customer wiring can be connected on this terminal strip. An additional 100 feet of 12 wire cable is provided for making the annunciator connections at the time of installation.

Figure 1 — Manual Transfer Swtich



1.2.4 UTILITY FAIL RELAY

A "dry-contact" signal is provided to annunciate when the Utility supply fails.

Singe-phase

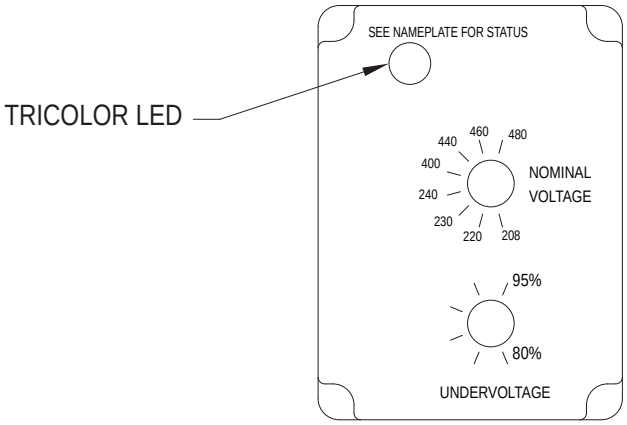
A 240 VAC coil relay is connected across the Utility supply terminals. The supply to the relay is fused with a 5A fuse in each line. The normally closed contacts of the relay are connected to the terminal strip for easy connection by the customer.

Three-phase

A three-phase voltage monitoring relay is connected across the utility supply terminals. The voltage monitor relay is adjustabe to the specific nominal voltage and the percent of dropout on undervoltage. The voltage monitor is provided with a tri-color LED (Figure 2).

LED STATUS	INDICATOR
Green Steady	Normal/Relay On
Green Flashing	Power Up/Restart
Red Flashing	Under/Overvoltage
Amber Flashing	Phase Loss
Green/Red Alternating	Under/Overvoltage Trip Pending
Red/Amber Alternating	Nominal Voltage Set Error

Figure 2 — LED Indicators



1.2.5 CERTIFICATIONS

This device is UL listed to meet the requirements of UL 1008 – Standard for Safety, Transfer Switch Equipment and CSA C22.2 No. 178 – Automatic Transfer Switches.

- Rated – 200A continuous @ 240 VAC.
- AIC rating 22kA Utility supply, 10kA Generator supply.

See markings on the transfer switch for further ratings and other additional information.

1.3 RATINGS — DATA LABEL

This TMS is rated 200 amp at 120/240 VAC single phase or, 120/208 or 120/240 VAC three phase. A DATA LABEL is permanently affixed to the transfer switch subplate. Use this TMS only within the specific limits shown on the DATA LABEL and the application decal located on the inside of the cabinet.

When requesting information or ordering parts for this equipment, make sure to include all information from the DATA LABEL. Record the Model and Serial numbers in the space provided.

MODEL #	
SERIAL #	

1.4 ENCLOSURE

The standard TMS switch enclosure is a UL type 3R. UL type 3R enclosures are intended for outdoor installation but can be mounted indoors as well. This enclosure provides protection against rain and sleet, and is undamaged by the formation of ice.

The enclosure door is latched with a single handle and 3-point latching system. The handle is padlockable so the cabinet door can be locked.

The main enclosure door is supplied from the factory with the hinges on the left side. The design of the door allows the door swing to be reversed in the field. Holes are provided on the left side of the cabinet for mounting of the hinges.

1.5 SAFE USE OF TRANSFER SWITCH

Before installing, operating or servicing this equipment, read the SAFETY RULES carefully. Comply strictly with all SAFETY RULES to prevent accidents and/or damage to the equipment. The manufacturer recommends making a copy of the SAFETY RULES and post them near the transfer switch. Also, be sure to read all instructions and information found on tags, labels and decals affixed to the equipment.

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

- NFPA 70; 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:

- Unpacking the TMS.
- Mounting the enclosure.
- Connecting power source and load leads.
- 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.

2.3 MOUNTING

Mounting dimensions for the transfer switch enclosure are in this manual. This enclosure is configured for wall-mounting using the tabs provided, top and bottom.

The TMS-200 is supplied with a removable mounting bracket. It is shipped from the factory attached to the top mounting brackets. If desired the mounting bracket can be removed from the enclosure and mounted to the wall first. Once the mounting bracket is attached to the wall the enclosure can be mounted to the bracket. It is necessary to use all mounting points provided, top and bottom.

The TMS-200 is supplied with strips of foam gasket material. This foam can be attached to the rear face of the enclosure. It is suggested to install the foam as close as possible to the outside edge to seal off the gap between the enclosure and the surface it is mounted to.

⚠ 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 UTILITY AND LOAD LINES

⚠ DANGER!

⚠ Make sure to turn OFF the NORMAL (UTILITY) power supply and unplug the GENERATOR power supply before connecting the power source and load lines to the transfer switch. Supply voltages are extremely high and dangerous. Contact with such high voltage power supply lines will cause extremely hazardous, possibly lethal, electrical shock.

The Utility power source and customer load connections are made on the circuit breakers. Access to the terminals is gained by removing the inner cover over the circuit breakers.

Conduits entering the enclosure need to be attached with a watertight connector listed for the wet locations. This is required to maintain the UL type 3R rating. If installed indoors, conduit/cable entry can be made with standard conduit connectors. Standard terminal lugs on all customer connection points are solderless, screw-type.

Connect power source and load conductors to clearly marked terminal lugs on the TMS as follows:

- UTILTY (Normal supply) leads: Ungrounded conductors connect to the top of the Utility Supply circuit breaker. Neutral connection is made at the 5-position terminal marked Neutral. Ground connection is made at the 2-2 conductor lugs marked GND.
- CUSTOMER LOAD leads: Ungrounded conductors connect mechanical lugs attached to the busbars at the bottom of the circuit breakers. Neutral connection is made at the 5-position terminal marked Neutral. Ground connection is made at the 2-2 conductor lugs marked GND.
- GENERATOR: This connection is made at the Cam-Lok™ terminals.

⚠ WARNING!

⚠ Before connecting or disconnecting the generator output leads from the Cam-Lok™ connectors be sure to open generator output circuit breaker and turn off generator.

The Cam-Lok™ connectors are not rated for making or interrupting current. Make sure that the generator is off and the output circuit breaker is open before connecting or disconnecting Cam-Lok™ connectors.

Connect the Cam-Lok™ connectors in the following order;

1. Green – Ground
2. White – Neutral
3. Black – Line 1
4. Red – Line 2
5. Blue – Line 3 (only used on 3-phase systems)

Disconnect the Cam-Lok™ connectors in the following order;

1. Blue – Line 3 (only used on 3-phase systems)
2. Red – Line 2
3. Black – Line 1
4. White – Neutral
5. Green – Ground

Conductor sizes must be adequate to handle the maximum current to which they will be subjected, based on the 75°C column of tables, charts, etc. used to size conductors. 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 a wire brush. If ALUMINUM conductors are used, apply corrosion inhibitor to conductors. After tightening terminal lugs, carefully wipe away any excess corrosion inhibitor.

Tighten terminal lugs to the torque values as noted inside the transfer switch door.

⚠ CAUTION!

⚠ Use a torque wrench to tighten the conductors, making sure not to overtighten, or damage to the switch base could occur. If undertightened, a loose connection would result, causing excess heat which could damage the switch base.

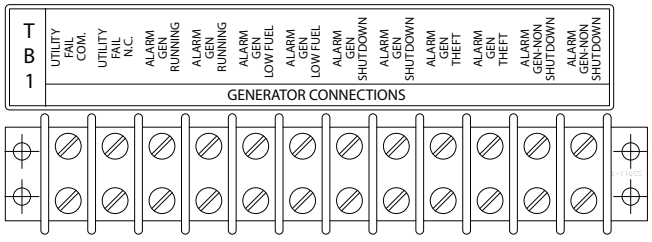
Be sure to maintain proper electrical clearance between live metal parts and grounded metal. Allow at least 1/2 inch for 100-400 Amp circuits.

2.4.1 GENERATOR ANNUNCIATOR CONNECTIONS

A terminal strip is provided to make the annunciator connections. A multi-conductor cable is provided for this purpose(100 foot).

Route the multi-conductor cable into the TMS enclosure, be sure to keep cable away from power leads. Secure in place using ty-wraps or other appropriate fasteners. Connect the wires to the terminal strip matching the functions declared on the terminal strip decal.

Figure 3 — Secondary Generator Connections



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 damage to the switch could result.

For 3-phase systems only; verify the voltage setting of the voltage sensing relay matches the system voltage. Adjust nominal voltage and undervoltage percent as necessary.

IMPORTANT: Before proceeding with functional tests, read and make sure to 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 – LOAD TRANSFER

3.2.1 CLOSE TO NORMAL SOURCE SIDE

Before proceeding, verify the position of the transfer switch mechanism by observing the position of the circuit breaker handles that are used in the manual transfer switch. If the Utility Supply circuit breaker handle is on (up position) the Customer Load is connected to the Utility Supply. No further action is required.

If the Generator Supply circuit breaker handle is ON (up position) the Customer Load is connected to the Generator Supply. Move Generator Supply circuit breaker handle to the OFF (down position). Move slider bar to the right side until it stops. Move Utility Supply circuit breaker handle to the ON (up position). Customer Load is now connected to the Utility Supply.

3.2.2 CLOSE TO GENERATOR SOURCE SIDE

Before proceeding, verify the position of the transfer switch mechanism by observing the position of the circuit breaker handles that are used in the manual transfer switch. If the Generator Supply circuit breaker handle is on (up position) the Customer Load is connected to the Generator Supply. No further action is required.

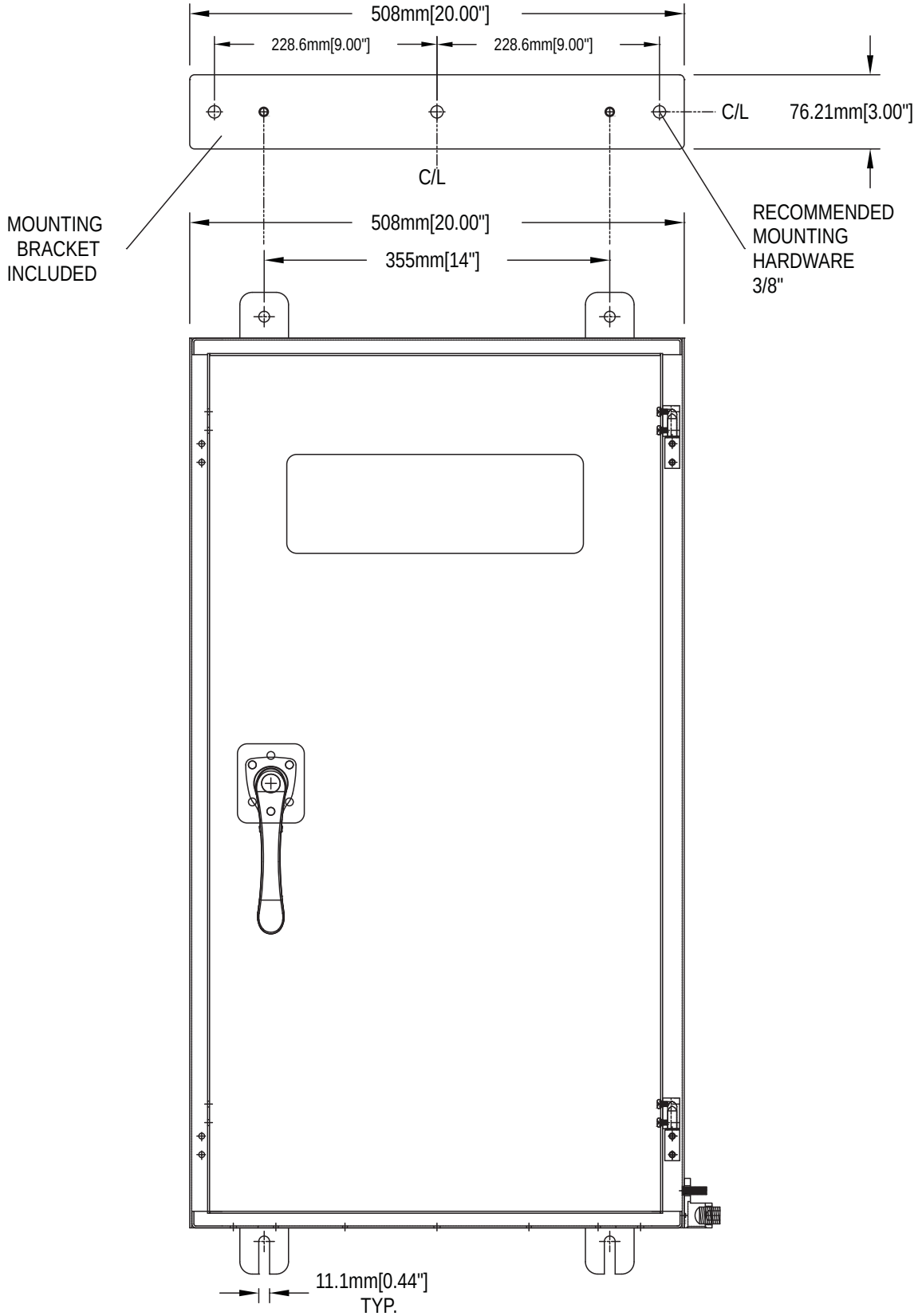
If the Utility Supply circuit breaker handle is ON (up position) the Customer Load is connected to the Utility Supply. Move Utility Supply circuit breaker handle to the OFF (down position). Move slider bar to the left side until it stops. Move Generator Supply circuit breaker handle to the ON (up position). Customer Load is now connected to the Utility Supply.

⚠ CAUTION!

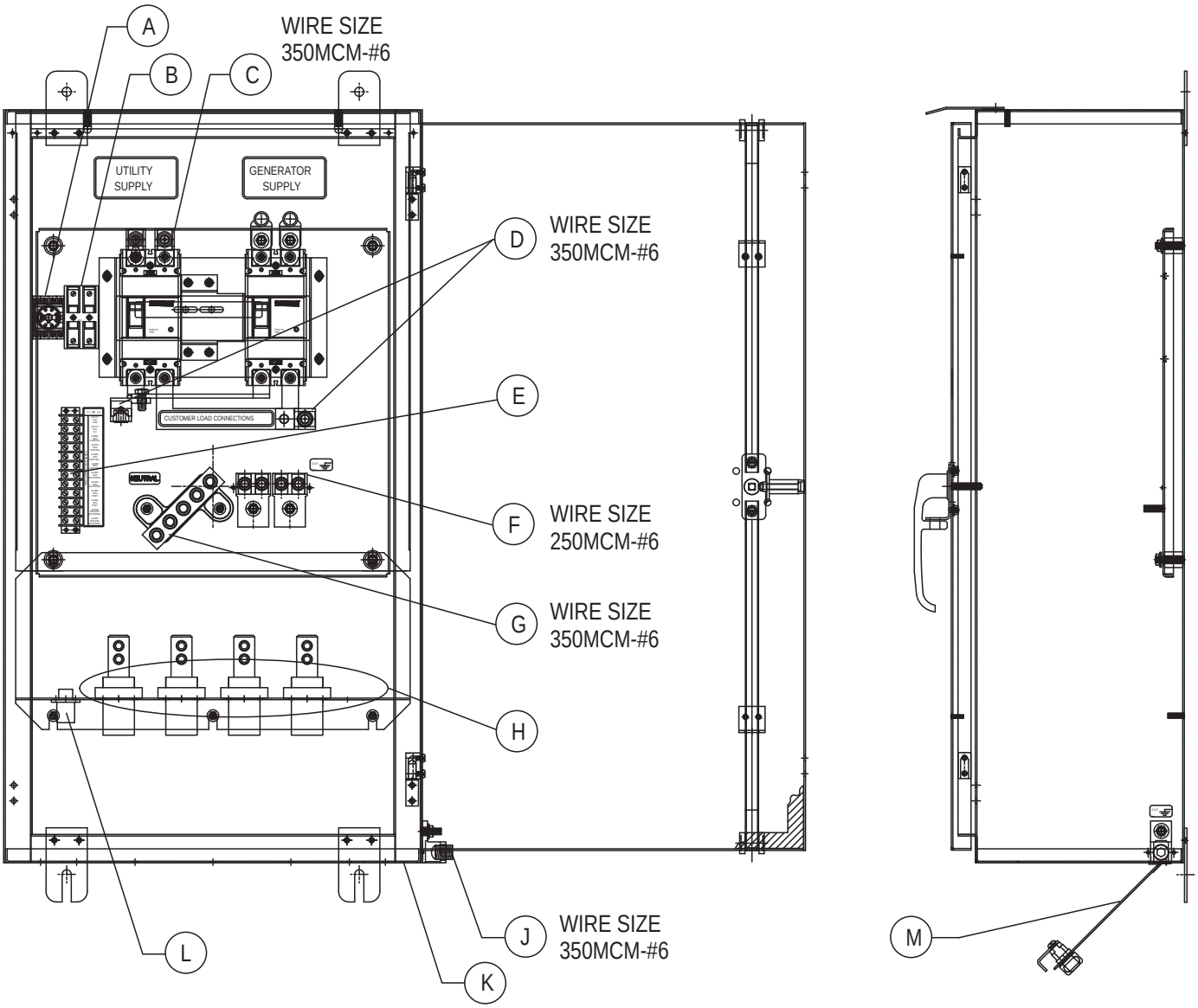
⚠ Do not use excessive force when operating the transfer switch manually or damage to the mechanisms could occur.

Installation Drawing

Drawing No. 0J9908ID-A



FRONT VIEW



A - RELAY, UTILITY FAIL
B - FUSES, 5AMP UTILITY
C - UTILITY UN-GROUNDED CONDUCTOR CONNECTION
D - CUSTOMER LOAD UN-GROUNDED CONDUCTOR CONNECTION
E - GENERATOR / UTILITY ANNUNCIATION CONNECTION
F - GROUND TERMINAL / CONNECTION
G - NEUTRAL TERMINAL / CONNECTION
H - GENERATOR CAM-LOK CONNECTORS
J - GROUND LUG
K - KNOCK-OUT - 3/4" - 1"
L - GENERATOR ANNUNCIATOR CONNECTOR
M - DOOR, CAM-LOK ACCESS
N - FOAM STRIPS (NOT SHOWN - USED BETWEEN WALL & ENCLOSURE)

Notes

Notes

Warranty

GENERAC POWER SYSTEMS STANDARD TWO-YEAR LIMITED WARRANTY FOR GENERAC EMERGENCY TRANSFER SWITCH SYSTEMS

NOTE: ALL UNITS MUST HAVE A START-UP INSPECTION PERFORMED BY AN AUTHORIZED GENERAC DEALER.

For a period of two (2) years of operation from the date of start up, Generac Power Systems, Inc. (Generac) will, at its option, repair or replace any part(s) which, upon examination, inspection, and testing by Generac or an Authorized/Certified Generac Dealer, or branch thereof, is found to be defective under normal use and service, in accordance with the warranty schedule set forth below. Repair or replacement pursuant to this limited warranty shall not renew or extend the original warranty period. Any repaired product shall be warranted for the remaining original warranty period only. Any equipment that the purchaser/owner claims to be defective must be examined by the nearest Authorized/Certified Generac Dealer, or branch thereof. This warranty applies only to Generac Transfer Switches used in "Standby" applications, as Generac has defined Standby, provided said transfer switch has been initially installed and/or inspected on-site by an Authorized/Certified Generac Dealer, or branch thereof. It is highly recommended that scheduled maintenance, as outlined by the transfer switch owner's manual, be performed by an Authorized/Certified Generac Dealer, or branch thereof. This will verify service has been performed on the unit throughout the warranty period.

*****This warranty only applies to units sold for use in the US and Canada.*****

WARRANTY SCHEDULE

YEAR ONE — Limited comprehensive coverage on mileage, labor, and parts listed.

- ALL COMPONENTS

YEAR TWO — Limited comprehensive coverage on parts listed.

- ALL COMPONENTS – PARTS ONLY

Guidelines:

1. Travel allowance is limited to 300 miles maximum, and 7.5 hours maximum (per occurrence), round trip, to the nearest authorized Generac Service Facility, and only applies to permanently wired and mounted units.
2. Warranty only applies to permanently wired and mounted units.
3. All warranty repairs, must be performed and/or addressed by an Authorized/Certified Generac Dealer, or branch thereof.
4. All warranty expense allowances are subject to the conditions defined in Generac's General Service Policy Manual.
5. Units that have been resold are not covered under the Generac Warranty, as this Warranty is not transferable.
6. Unit enclosure is only covered during the first year of the warranty provision.
7. Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by the warranty.
8. Generac may choose to Repair, Replace or Refund a piece of equipment.
9. Warranty Labor Rates are based on normal working hours. Additional costs for overtime, holiday or emergency labor costs for repairs outside of normal business hours will be the responsibility of the customer.
10. Warranty Parts shipment costs are reimbursed at ground shipment rates. Costs related to requests for expedited shipping will be the responsibility of the customer.
11. Verification of required maintenance may be required for warranty coverage.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

Any unit built/manufactured prior to July 1, 2004.

1. Costs of normal maintenance (i.e., installation and start-up).
2. Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as Generac has defined Prime Power,Trailer Mounted or Rental Unit. Contact a Generac Distributor for Prime Power, Trailer Mounted or Rental Unit definition and warranty.
3. Failures caused by any external cause or act of God including, without limitation, collision, theft, vandalism, riot or wars, nuclear event, fire, freezing, lightning, earthquake, windstorm, hail, volcanic eruption, water or flood, tornado or hurricane.
4. Products that are modified or altered in a manner not authorized by Generac in writing.
5. Failures due, but not limited to, normal wear and tear, accident, misuse, abuse, negligence, or improper installation, maintenance, or sizing.
6. Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
7. Damage related to rodent and/or insect infestation.
8. Failure due to misapplication, misrepresentation, or bi-fuel conversion.
9. Telephone, facsimile, cellular phone, satellite, Internet, or any other communication expenses.
10. Rental equipment used while warranty repairs are being performed (i.e. rental generators, cranes, etc.).
11. Modes of transportation deemed abnormal (refer to Generac General Service Policy Manual).
12. Steel enclosures that are rusting due to improper installation, location in a harsh or saltwater environment or scratched where integrity of paint applied is compromised.
13. Any and all expenses incurred investigating performance complaints unless defective Generac materials and/or workmanship were the direct cause of the problem.

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Any implied warranties allowed by law shall be limited in duration to the terms of the express warranty provided herein. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to purchaser/owner. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights. You also may have other rights that vary from state to state.

Generac Power Systems, Inc. • P.O. Box 8 • Waukesha, WI 53187 • Ph: (262) 544-4811 • Fax: (262) 544-4851

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