

Owner's Manual *For* *Automatic Transfer Switch*

Model Numbers

100 - 200 Amp, Single Phase Non-Service Entrance

RTSI100M3

RTSI200M3

100 - 400 Amp, Three Phase Non-Service Entrance

RTSN100R3

RTSN200R3

RTSN400R3

MODEL NUMBER: _____

SERIAL NUMBER: _____

DATE PURCHASED: _____

WWW.GENERAC.COM

1-888-GENERAC

(1-888-436-3722)



Para español, visita: <http://www.generac.com/service-support/product-support-lookup>

Pour le français, visiter : <http://www.generac.com/service-support/product-support-lookup>

SAVE THIS MANUAL FOR FUTURE REFERENCE

 **WARNING**

CANCER AND REPRODUCTIVE HARM

www.P65Warnings.ca.gov

(000393a)

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Section 1: Introduction and Safety

Introduction

Thank you for purchasing a Generac Power Systems Inc. product. This unit has been designed to provide high-performance, efficient operation, and years of use when maintained properly. This transfer switch is listed with ETL under UL1008 standard.

Read This Manual Thoroughly



WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

If any section of this manual is not understood, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit www.generac.com for starting, operating, and servicing procedures. The owner is responsible for proper maintenance and safe use of the unit.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions that must be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit, and instruct them on how to correctly start, operate, and stop the unit in case of emergency.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are not all inclusive. If using a procedure, work method, or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others and does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the unit, 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. Alert definitions are as follows:

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

(000001)

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

(000002)

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

(000003)

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

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

Safety Symbols and Meanings



⚠ DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)



⚠ DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.

(000104)



⚠ DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury.

(000145)

⚠ DANGER

Electrical backfeed. Use only approved switchgear to isolate generator from the normal power source. Failure to do so will result in death, serious injury, and equipment damage.

(000237)



⚠ DANGER

Electrocution, equipment and property damage. Handle transfer switches carefully when installing. Never install a damaged transfer switch. Doing so could result in death or serious injury, equipment and property damage.

(000195)



⚠ DANGER

Electrocution. Turn utility supply OFF before working on utility connections of the transfer switch. Failure to do so will result in death or serious injury.

(000123)



⚠ DANGER

Electrocution. Do not disable or modify the connection box door safety switch. Doing so will result in death or serious injury.

(000157)

⚠ DANGER

Automatic start-up. Disconnect utility power and render unit inoperable before working on unit. Failure to do so will result in death or serious injury.

(000191)

⚠ DANGER

Equipment malfunction. Installing a dirty or damaged transfer switch will cause equipment malfunction and will result in death or serious injury.

(000119)



⚠ WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

(000100a)

⚠ WARNING

Electric shock. Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000155a)

⚠ CAUTION

Equipment damage. Verify all conductors are tightened to the factory specified torque value. Failure to do so could result in damage to the switch base.

(000120)

⚠ CAUTION

Equipment damage. Perform functional tests in the exact order they are presented in the manual. Failure to do so could result in equipment damage.

(000121)

⚠ CAUTION

Equipment damage. Exceeding rated voltage and current will damage the auxiliary contacts. Verify that voltage and current are within specification before energizing this equipment.

(000134a)

General Hazards

⚠ DANGER

Electrical backfeed. Use only approved switchgear to isolate generator from the normal power source. Failure to do so will result in death, serious injury, and equipment damage.

(000237)



⚠ DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)



⚠ DANGER

Electrocution. Turn utility supply OFF before working on utility connections of the transfer switch. Failure to do so will result in death or serious injury.

(000123)



⚠ DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.

(000104)



⚠ DANGER

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury.

(000188)



⚠ DANGER

Electrocution. Only authorized personnel should access transfer switch interior. Transfer switch doors should be kept closed and locked. Failure to do so will result in death or serious injury.

(000213)

⚠ DANGER

Automatic start-up. Disconnect utility power and render unit inoperable before working on unit. Failure to do so will result in death or serious injury.

(000191)



⚠ DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury.

(000145)



⚠ WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury.

(000209b)

⚠ WARNING

Equipment damage. This unit is not intended for use as a prime power source. It is intended for use as an intermediate power supply in the event of temporary power outage only. Doing so could result in death, serious injury, and equipment damage.

(000247a)

⚠ WARNING

Sudden start-up. Always set the safety disconnect switch to MANUAL before working on equipment. Failure to do so could result in death or serious injury.

(000194)

- 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 established by the National Electrical Code (NEC), CSA Standard; C22.1 Canadian Electric Code, the Occupational Safety and Health Administration (OSHA), or the local agency for workplace health and safety.
- If working 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.
- Any voltage measurements should be performed with a meter that meets UL3111 safety standards, and meets or exceeds overvoltage class CAT III.

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Section 2: General Information

Introduction

Thank you for purchasing a Generac transfer switch. 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 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 or manual at any time without prior notice.

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.

Contents in Loose Parts Bag

- Owner's manual
- Warranty statement
- Manual operating handle
- Storage bracket for manual operating handle
- Fault current label
- Clear decal for fault current label

Equipment Description

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

The transfer switch consists of a transfer mechanism, a control relay, a terminal strip and fuse holder for connection of sensing wires.

The transfer switch consists of a transfer mechanism, a relay control, and a terminal strip for connection of sensing and load voltage wires.

This switch is suitable for control of motors, electric discharge lamps, tungsten filament and electric heating equipment where the sum of motor full-load ampere ratings of other loads do not exceed the ampere rating of the switch, and the tungsten load does not exceed 30% of the switch rating.

The transfer switch is for use in optional standby systems only.

A single-phase 100A rated switch is suitable for use on circuits capable of delivering not more than 5,000 RMS symmetrical amperes, 250 VAC maximum, when protected by a 100A maximum circuit breaker (Siemens types QP or BQ) or 150A maximum circuit breaker (Square D Q2, Westinghouse CA-CAH, General Electric TQ2 and Siemens QJ2).

A three-phase 100A rated switch is suitable for use on circuits capable of delivering not more than 12,500 RMS symmetrical amperes, 415 VAC maximum, when protected by a circuit breaker without an adjustable short time response or by fuses.

A single-phase 200A rated switch is suitable for use on a circuit capable of 10,000 rms symmetrical amperes, 250 VAC maximum when protected by a circuit breaker without an adjustable short time response or by fuses.

A three-phase 200A rated switch is suitable for use on a circuit capable of 25,000 rms symmetrical amperes, 415 VAC maximum when protected by a circuit breaker without an adjustable short time response or by fuses.

A three-phase 400A rated switch is suitable for use on a circuit capable of 30,000 rms symmetrical amperes, 415 VAC maximum when protected by a circuit breaker without an adjustable short time response or by fuses.

Transfer Switch Mechanism

These switches ([Figure 2-1](#)) are used with a single-phase or three-phase system, when the NEUTRAL line is to be connected to a neutral lug and is not to be switched.

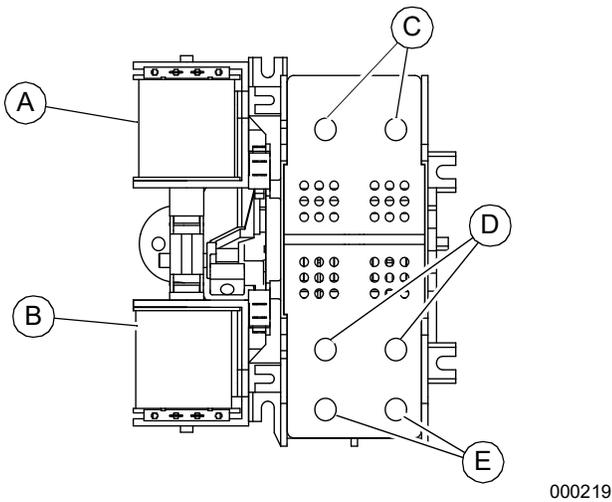
Solderless, screw-type terminal lugs are standard.

The conductor size range is as follows:

Switch Rating	Wire Range	Conductor Tightening Torque
100A	#14-1/0 AWG (Cu/Al)	50 in-lbs (5.6 Nm)
200A	#6-250 MCM (Cu/Al)	275 in-lbs (31 Nm)
400A	(1) #6-250 MCM or (2) 1/0-250 MCM (Cu/Al)	375 in-lbs (42 Nm)

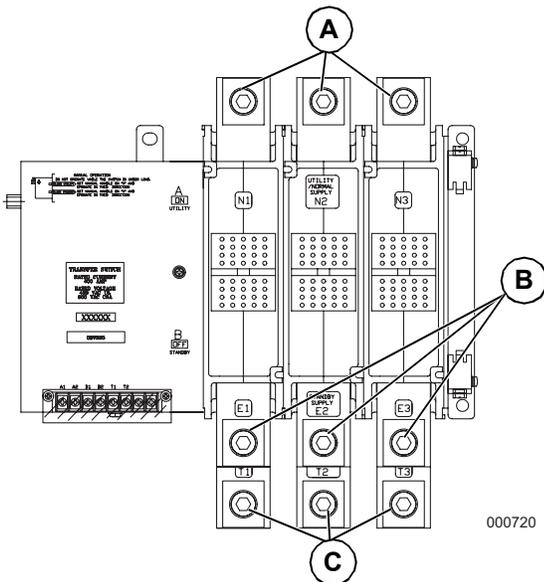
This transfer switch is suitable for control of motors, electric discharge lamps, tungsten filament and electric heating equipment where the sum of motor full load ampere ratings and the ampere ratings of other loads do

not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of the switch rating.



000219
Figure 2-1. Typical Single-Phase ATS Transfer Mechanism

A	Utility Closing Coil
B	Generator Closing Coil
C	Utility Lugs (N1 & N2)
D	Generator Lugs (E1 & E2)
E	Load Lugs (T1 & T2)



000720
Figure 2-2. Typical Three-Phase 400 Amp Transfer Mechanism

A	Utility Lugs (N1, N2 & N3)
B	Generator Lugs (E1, E2 & E3)
C	Load Lugs (T1, T2 & T3)

Transfer Switch Data Decal

A data decal is permanently affixed to the transfer switch enclosure. Use this transfer switch only with the specific limits shown on the data decal 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 decal.

For future reference, record the Model and Serial numbers in the space provided on the front cover of this manual.

Transfer Switch Enclosure

The standard switch enclosure is a National Electrical Manufacturer’s Association (NEMA) 3R type. NEMA 3R (indoor/outdoor rated) type enclosures primarily provide a degree of protection against falling rain and sleet; are undamaged by the formation of ice on the enclosure.

Safe Use of Transfer Switch



WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

Before installing, operating or servicing this equipment, read **Safety Rules** carefully. Comply strictly with all information presented in **Safety Rules** to prevent accidents and/or damage to the equipment. The manufacturer recommends that a copy of **Safety Rules** be posted near the transfer switch. Also, be sure to read all instructions and information found on tags, labels and decals affixed to the equipment.

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

- NFPA 70: National Electrical Code
- NFPA 70E: Standard for Electrical Safety in the Workplace
- UL 1008: Standard for Safety—Automatic Transfer Switches
- UL 67: Standard for Safety—Panelboard

NOTE: It is essential to use the latest version of any standard to verify correct and current information.

Section 3: Installation

Introduction

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 and sensing circuit.
- Manually operating switch to set operator toggle.
- Testing functions.

Verify factory torque of conductors as well as electrical harness connections.

Mounting

Mounting dimensions for the transfer switch enclosure are in this manual. Enclosures are typically wall-mounted. See [Drawings and Diagrams](#).



⚠ DANGER

Electrocution, equipment and property damage. Handle transfer switches carefully when installing. Never install a damaged transfer switch. Doing so could result in death or serious injury, equipment and property damage. (000195)

⚠ DANGER

Equipment malfunction. Installing a dirty or damaged transfer switch will cause equipment malfunction and will result in death or serious injury. (000119)

This transfer switch is mounted in a NEMA 3R enclosure. It can be mounted outside or inside and should be based on the layout of installation, convenience and proximity to the utility supply and load center.

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.

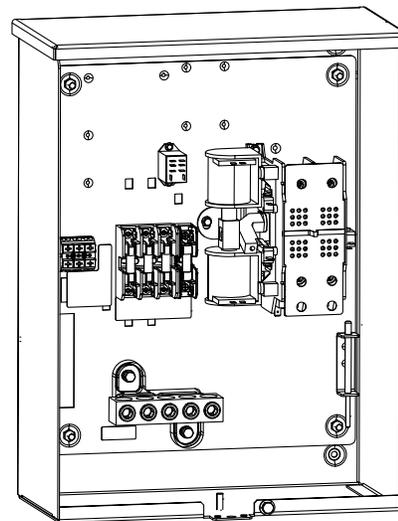
Protect the switch against impact at all times, and against construction grit and metal chips.

1. Locate automatic transfer switch in close proximity to the main distribution panel. The transfer switch can be located to the left or right of the main distribution panel. One foot (0.3 m) is the suggested distance.

NOTE: The transfer switch may be located a different distance from the main panel depending on available mounting area. Always adhere to local electrical codes during installation.

2. Hold transfer switch against the mounting surface. Level the transfer switch and mark the mounting holes.
3. Drill the appropriate size pilot holes.
4. Mount transfer switch to mounting surface with appropriate fasteners.

NOTE: See [Figure 3-1](#). Transfer switch **MUST** be mounted vertically as shown.



013447

Figure 3-1. Mount Transfer Switch

5. Switch service main circuit breaker to OFF (OPEN) before removing cover or any wiring in the main electrical distribution panel. The wires connected to the service main circuit breaker remain LIVE or HOT. Avoid contact with these wires and the service main circuit breaker connection lugs.

Connecting Power Source and Load Lines



DANGER

Electrocution. Only authorized personnel should access transfer switch interior. Transfer switch doors should be kept closed and locked. Failure to do so will result in death or serious injury. (000213)



DANGER

Electrocution. Turn utility and emergency power supplies to OFF before connecting power source and load lines. Failure to do so will result in death or serious injury. (000116)

WARNING

Electric shock. Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage. (000155a)

Installation and interconnection diagrams are provided in this manual.

NOTE: All installations must comply with national, state and local codes. It is the responsibility of the installer to perform an installation that will pass the final electrical inspection.

The utility supply connection is made at the utility service disconnect circuit breaker terminals. The generator and customer load connections are made at the transfer switch mechanism, inside the switch enclosure.

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.

All power cables can enter the enclosure through the knockouts provided. If not using the knockouts, conduit entry into the enclosure above the level of uninsulated live parts shall use fittings listed for use in wet locations to maintain the Type 3R rating. Conduits should be arranged to provide separation between the Utility and Generator supply conductors inside the enclosure.

NOTE: 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 on the decal located on the inside of the door. After tightening terminal lugs, carefully wipe away any excess corrosion inhibitor.

CAUTION

Equipment damage. Verify all conductors are tightened to the factory specified torque value. Failure to do so could result in damage to the switch base.

(000120)

Connect power source and load conductors to clearly marked terminal lugs on transfer mechanism as follows:

1. Connect utility (normal) power source cables to utility service disconnect circuit breaker.
2. Connect the generator (standby) source power cables to transfer switch terminals E1, E2.
3. Connect customer LOAD leads to switch terminals T1, T2.

Connecting Start Circuit Wires

Control system interconnections (Electrical Data section) consist of UTILITY 1 (N1), UTILITY 2 (N2), and LOAD (T1), and leads 23 and 194. Reference instruction manual of specific engine generator for wiring connection details. Recommended wire gauge sizes for this wiring depends on the length of the wire, as recommended in the following chart:

Maximum Wire Length	Recommended Wire Size
1–115 ft (0.3–35 m)	No. 18 AWG
116–185 ft (36–56 m)	No. 16 AWG
186–295 ft (57–89 m)	No. 14 AWG
296–460 ft (90–140 m)	No. 12 AWG

Exception: Conductors of AC and DC circuits, rated 1000 volts nominal or less, shall be permitted to occupy the same equipment, cable, or conduit. All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the equipment, cable, or conduit. See NEC 300.3(C)(1).

Auxiliary Contacts

If desired, there are 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 terminal (D). See [Figure 3-2](#).

See [Figure 3-2](#).

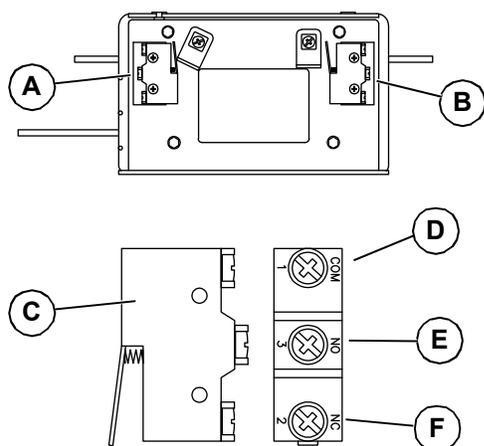
Contact operation is shown in the following chart:

	Transfer Switch Position	
	Utility	Standby
Common to Normally Open (B)	Open	Closed
Common to Normally Closed (A)	Closed	Open

NOTE: Auxiliary Contacts are rated 10 amps at 125 or 250 volts AC.

CAUTION

Equipment damage. Exceeding rated voltage and current will damage the auxiliary contacts. Verify that voltage and current are within specification before energizing this equipment. (000134a)



000140

Figure 3-2. Auxiliary Contacts

A	Auxiliary Contact (Actuated, Shown in Standby Mode)
B	Auxiliary Contact (Non-Actuated, Shown in Standby Mode)
C	Single Contact (Utility Position)
D	Common Terminal
E	Normally Open Terminal
F	Normally Closed Terminal

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Section 4: Operation

Functional Tests and Adjustments

Following transfer switch installation and interconnection, inspect the entire installation carefully. A competent, qualified electrician should inspect it. The installation must 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.

CAUTION

Equipment damage. Perform functional tests in the exact order they are presented in the manual. Failure to do so could result in equipment damage.

(000121)

IMPORTANT: Before proceeding with functional tests, read and make sure all instructions and information in this section is understood. 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.

Manual Operation Single Phase



DANGER

Electrocution. Do not manually transfer under load. Disconnect transfer switch from all power sources prior to manual transfer. Failure to do so will result in death or serious injury, and equipment damage.

(000132)

See [Figure 4-2](#). A manual transfer handle (1) is shipped with the transfer switch.

IMPORTANT NOTE: Manual operation must be done prior to electrical operation. This is to reset the toggle after shipping and to verify there are no wiring obstructions near moving parts. To check manual operation, proceed as follows:

1. Verify the generator is in the OFF mode.
2. Turn OFF both UTILITY (service disconnect circuit breaker) and EMERGENCY (generator main line circuit breaker) power supplies to the transfer switch.
3. Note position of transfer mechanism main contacts by observing the movable contact carrier arm. This can be viewed through the long narrow slot in the inside cover of the ATS. The top of the moveable contact carrier arm is yellow to be easily identified.
 - Manual operation handle in the UP position - LOAD terminals (T1, T2) are connected to UTILITY terminals (N1, N2).

- Manual operation handle in the DOWN position - LOAD terminals (T1, T2) are connected to EMERGENCY terminals (E1, E2).

CAUTION

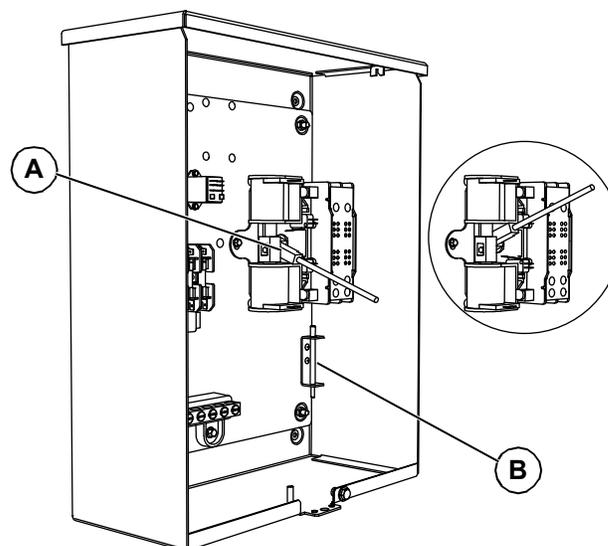
Equipment damage. Do not use excessive force while manually operating the transfer switch. Doing so could result in equipment damage.

(000122)

Close to Utility Source Side

See [Figure 4-1](#). Before proceeding, verify the position of the switch by observing the position of the manual operation handle. If the handle is UP, the contacts are closed in the NORMAL (UTILITY) position, no further action is required. If the handle is DOWN, proceed with Step 1.

1. With the handle inserted into the moveable contact carrier arm (see A in [Figure 4-1](#)), move handle UP. Be sure to hold on to the handle as it will move quickly after the center of travel.
2. Remove manual operating handle from moveable contact carrier arm. Return handle to storage bracket (see B in [Figure 4-1](#)).



000228

Figure 4-1. Manual Operation

Close to Emergency Source Side

See [Figure 4-1](#). Before proceeding, verify the position of the switch by observing the position of the manual operation handle. If the handle is DOWN, the contacts are closed in the GENERATOR (STANDBY) position. No further action is required. If the handle is UP, proceed with Step 1.

1. With the handle inserted into the moveable contact carrier arm, move the handle DOWN. Be sure to hold on to the handle as it will move quickly after the center of travel.
2. Remove manual operating handle from moveable contact carrier arm. Return handle to storage bracket.

Return to Utility Source Side

1. Manually actuate switch to return manual operating handle to the UP position.
2. Remove manual operating handle from moveable contact carrier arm. Return handle to storage bracket.

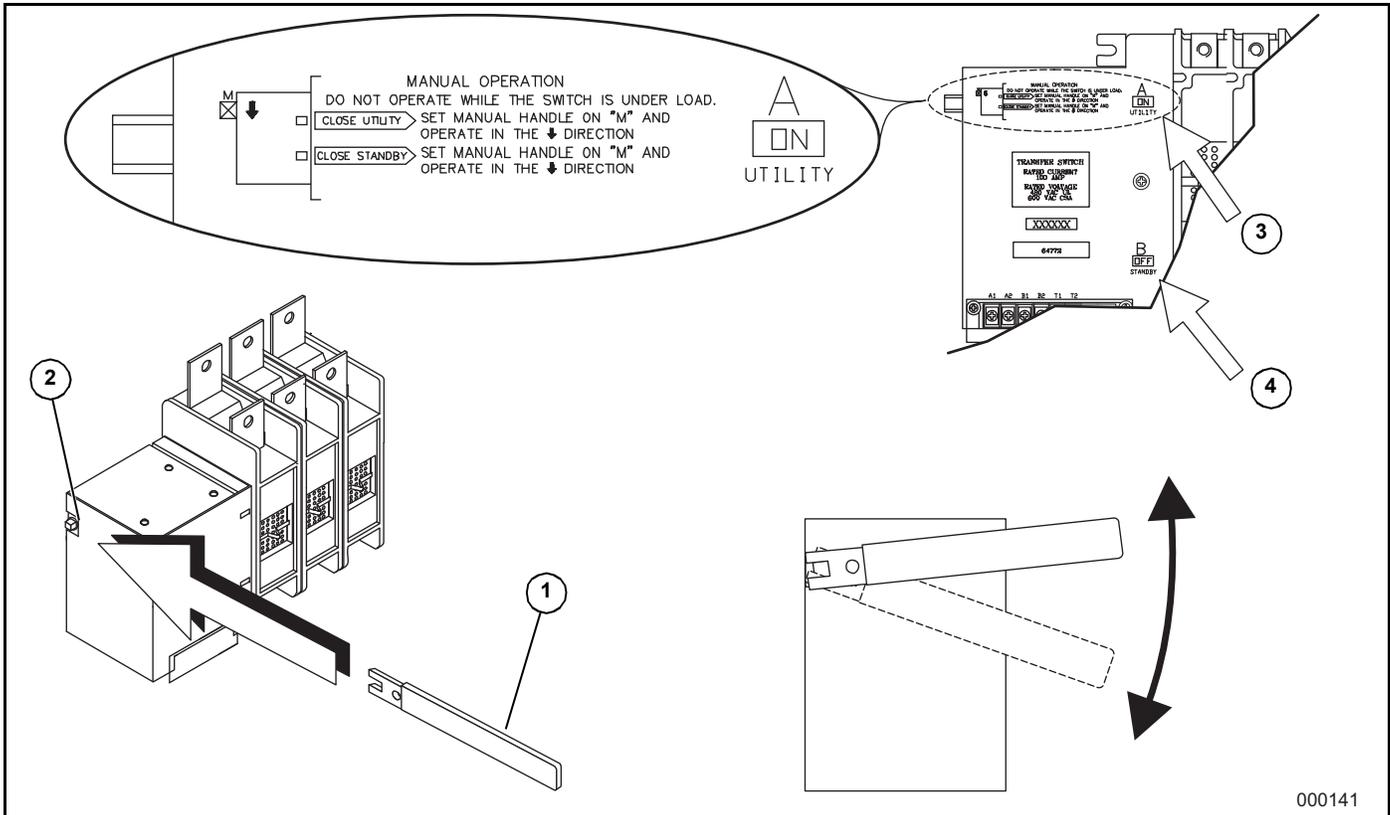


Figure 4-2. Actuating Transfer Switch

Manual Operation Three Phase



⚠ DANGER

Electrocution. Do not manually transfer under load. Disconnect transfer switch from all power sources prior to manual transfer. Failure to do so will result in death or serious injury, and equipment damage.

(000132)

See [Figure 4-1](#). A manual transfer handle (1) is shipped with the transfer switch.

IMPORTANT NOTE: Manual operation must be done prior to electrical operation. This is to reset the toggle after shipping and to verify there are no wiring obstructions near moving parts. To check manual operation, proceed as follows:

1. Verify the generator is in the OFF mode.
2. Turn OFF both UTILITY (service disconnect circuit breaker) and EMERGENCY (generator main line circuit breaker) power supplies to the transfer switch.

3. Note position of transfer mechanism main contacts by observing display windows in “A” and “B” (3 and 4 in [Figure 4-2](#)) as follows:

- Window “A” ON, Window “B” OFF - LOAD terminals (T1, T2) are connected to utility terminals (N1, N2).
- Window “A” OFF, Window “B” ON - LOAD terminals (T1, T2) are connected to emergency terminals (E1, E2).

⚠ CAUTION

Equipment damage. Do not use excessive force while manually operating the transfer switch. Doing so could result in equipment damage.

(000122)

Close to Normal Source Side

See **Figure 4-1**. Before proceeding, verify the position of the switch by observing Window “A.” If Window “A” reads “ON,” the contacts are closed in the normal position, no further action is required. If it reads “OFF,” proceed as follows:

- Attach handle to actuating shaft (see 2 in **Figure 4-1**). Move handle in the direction of the arrow on the switch cover until it stops — DO NOT FORCE. Release handle slowly to allow the spring in the switch box to relax. “ON” now appears in Window “A” and “OFF” appears in Window “B.”

Close to Standby Source Side

See **Figure 4-1**. Before proceeding, verify the position of the switch by observing Window “B.” If Window “B” reads “ON,” the contacts are closed in the EMERGENCY (STANDBY) position. No further action is required. If it reads “OFF,” proceed as follows:

- Attach handle to actuating shaft (see 2 in **Figure 4-1**). Move the handle in the direction of the arrow on the switch cover until it stops - DO NOT FORCE. Release handle slowly to allow the spring in the switch box to relax. “OFF” now appears in Window “A” and “ON” appears in Window “B.”

Return to Normal Source Side

Manually actuate switch to return Window “A” to the “ON” position.

Voltage Checks Single Phase

NOTE: Use the Digital Multimeter (DMM) LowZ low input impedance setting to collect accurate voltage measurements. LowZ eliminates the possibility of inaccurate ghost voltage readings, also known as phantom voltage or stray voltage readings. See DMM manufacturer’s literature for additional information.

Utility Voltage Checks



⚠ DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)

1. Turn ON the UTILITY power supply to the transfer switch using the utility service disconnect circuit breaker.

2. With an accurate AC voltmeter, check for correct voltage. Measure across ATS terminal lugs N1 and N2.
3. When certain that UTILITY supply voltage is correct and compatible with transfer switch ratings, turn OFF the UTILITY supply to the transfer switch.

Generator Voltage Checks



⚠ DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)

1. On the generator panel, select the MANUAL mode of operation. The generator should crank and start.
2. Let the generator stabilize and warm up at no-load for at least five minutes.
3. Set the generator main circuit breaker (CB1) to ON or CLOSED.
4. With an accurate AC voltmeter and frequency meter, check the no-load, voltage and frequency. Measure across ATS terminal lugs E1 to E2. The table below shows values acceptable for 250VAC single-phase application as an example.

Frequency	50-52 Hz
Terminals E1 to E2	250-256 VAC

5. When certain that generator supply voltage is correct and compatible with transfer switch ratings, turn OFF the generator supply to the transfer switch.
6. Set the generator main circuit breaker (CB1) to OFF or OPEN.
7. On the generator panel, select the OFF mode to shut down the generator.

NOTE: Do NOT proceed until generator AC output voltage and frequency are correct and within stated limits. If the no-load voltage is correct but no-load frequency is incorrect, the engine governed speed may require adjustment. If no-load frequency is correct but voltage is not, the voltage regulator may require adjustment.

Voltage Checks Three Phase

NOTE: Use the Digital Multimeter (DMM) LowZ low input impedance setting to collect accurate voltage measurements. LowZ eliminates the possibility of inaccurate ghost voltage readings, also known as phantom voltage or stray voltage readings. See DMM manufacturer's literature for additional information.

Utility Voltage Checks



⚠ DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)

1. Turn ON the UTILITY power supply to the transfer switch with whatever means provided (such as the UTILITY main line circuit breaker).
2. With an accurate AC voltmeter, check for correct voltage. Measure across ATS terminal lugs N1 and N2; N1 to NEUTRAL and N2 to NEUTRAL.
3. When certain that UTILITY supply voltage is correct and compatible with transfer switch ratings, turn OFF the UTILITY supply to the transfer switch.

Generator Voltage Checks



⚠ DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)

1. On the generator panel, select the MANUAL mode of operation. The generator should crank and start.
2. Let the generator stabilize and warm up at no-load for at least five minutes.
3. Set the generator main circuit breaker (CB1) to ON or CLOSED.
4. With an accurate AC voltmeter and frequency meter, check the no-load, voltage and frequency. Measure across ATS terminal lugs E1 to E2; E1 to NEUTRAL and E2 to NEUTRAL. The table below shows values acceptable for 415 VAC three-phase application as an example.

Frequency	50-52 Hz
Terminals E1 to E2	415-425 VAC
Terminals E1 to NEUTRAL	240-245 VAC
Terminals E2 to NEUTRAL	240-245 VAC

5. When certain that generator supply voltage is correct and compatible with transfer switch ratings, turn OFF the generator supply to the transfer switch.
6. Set the generator main circuit breaker (CB1) to OFF or OPEN.
7. On the generator panel, select the OFF mode to shut down the generator.

NOTE: Do NOT proceed until generator AC output voltage and frequency are correct and within stated limits. If the no-load voltage is correct but no-load frequency is incorrect, the engine governed speed may require adjustment. If no-load frequency is correct but voltage is not, the voltage regulator may require adjustment.

Generator Tests Under Load

1. Set the generator main circuit breaker to OFF or OPEN.
2. Set the utility service disconnect circuit breaker to OFF or OPEN.
3. Manually actuate the transfer switch main contacts to the emergency (Standby) position. See [Manual Operation Single Phase](#) or [Manual Operation Three Phase](#).
4. To start the generator, select the MANUAL mode of operation. When engine starts, let it stabilize for a few minutes.
5. Set the generator main circuit breaker to ON or CLOSED. The generator now powers all LOAD circuits. Check generator operation under load as follows:
 - Turn on electrical loads to the full rated wattage/ amperage capacity of the generator. DO NOT OVERLOAD.
 - With maximum rated load applied, check voltage and frequency across transfer switch terminals E1 and E2. Voltage should be greater than normal phase to phase voltage; frequency should be greater than 49 Hz.
 - Verify that the gas pressure remains within acceptable parameters (see the generator's Installation Manual).
 - Let the generator run under rated load for at least 30 minutes. With unit running, listen for unusual noises, vibration, overheating, etc., that might indicate a problem.
6. When checkout under load is complete, set main circuit breaker of the generator to the OFF or OPEN position.
7. Let the generator run at no-load for several minutes. Then, shut down by selecting the OFF mode.

8. Move the main switch contacts back to the utility position.

NOTE: See *Manual Operation Single Phase* or *Manual Operation Three Phase*. Handle and operating lever of transfer switch should be in down position.

9. Turn on the utility power supply to transfer switch, using whatever means provided (such as a utility main line circuit breaker). The utility power source now powers the loads.
10. The system is now set for fully automatic operation

Checking Automatic Operation

To check the system for proper automatic operation, proceed as follows:

1. Verify generator is in OFF mode.
2. Verify switch is de-energized.
3. Install front cover of the transfer switch.
4. Turn the utility power supply to the transfer switch ON, using the utility main line circuit breaker.
5. Set the generator main circuit breaker to ON.
6. On the generator panel, select AUTO. The system is now ready for automatic operation.
7. Turn utility power supply to the transfer switch OFF.

With the generator ready for automatic operation, the engine should crank and start when the utility source power is turned OFF after a ten second delay (factory default setting). After starting, the transfer switch should connect load circuits to the standby side after a five second delay. Let the system operate through its entire automatic sequence of operation.

With the generator running and loads powered by generator AC output, turn ON the utility power supply to the transfer switch. The following should occur:

- After approximately 15 seconds, the switch should transfer loads back to the utility power source.
- Approximately one minute after re-transfer, the engine should shut down.

With the generator in the AUTOMATIC mode, the system is now set for fully automatic operation.

Shutting Generator Down While Under Load

IMPORTANT NOTE: To avoid equipment damage, follow these steps, in order, when shutting the generator down during utility outages. Shutdowns may be required during outages to perform routine maintenance or to conserve fuel.

To turn the generator OFF (while running in AUTO and on-line):

1. Turn the main utility disconnect OFF (OPEN).
2. Turn the generator MLCB (generator disconnect) to OFF (OPEN).

3. Run the generator for approximately one minute for proper cooling.
4. Turn the generator OFF.

To turn the generator back ON:

1. Put the generator into AUTO.
2. Start generator and warm up for a few minutes.
3. Set the MLCB (generator disconnect) to ON (CLOSED).

The transfer switch will return to utility mode and the generator will cycle off after it times out.

The system will now be operating in automatic mode. The main utility disconnect can be turned ON (CLOSED).

To shut the unit off, repeat this entire process.

Installation Summary

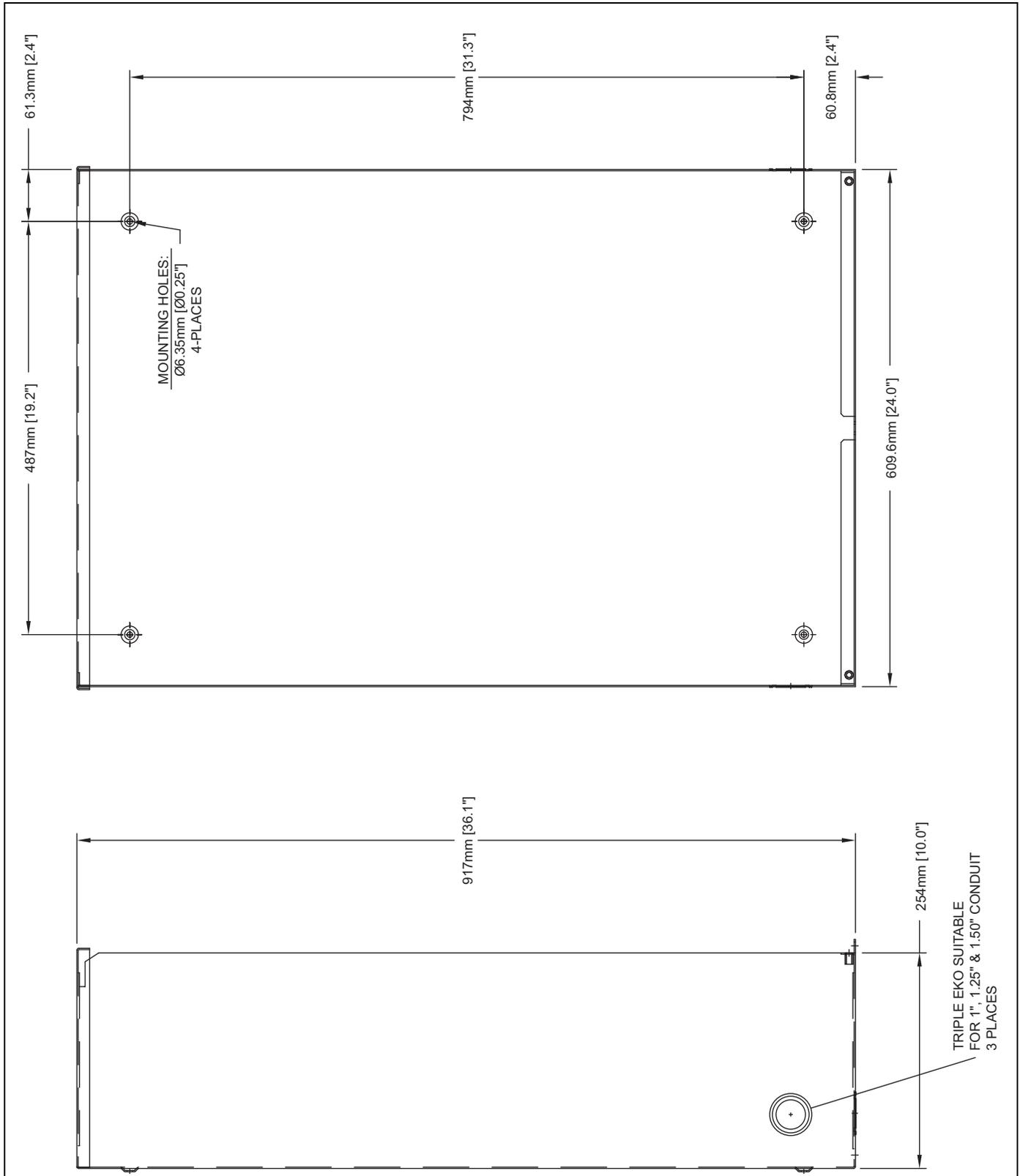
1. Verify the installation has been properly performed as outlined by the manufacturer and that it meets all applicable laws and codes.
2. Verify proper operation of the system as outlined in the appropriate Installation and Owner's Manuals.
3. Educate the end user on the proper operation, maintenance and service call procedures.

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Section 5: Drawings and Diagrams

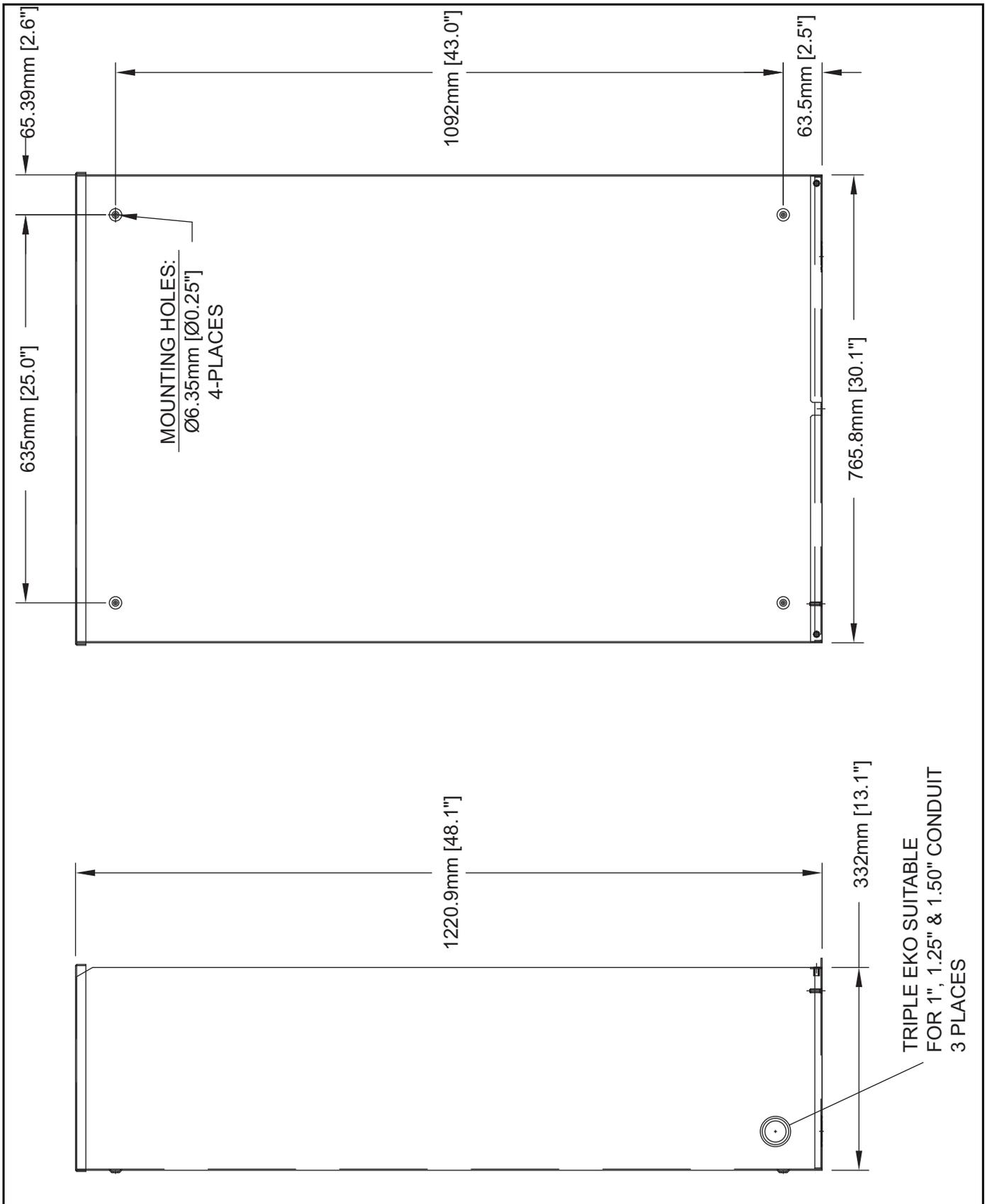
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No. 0F6401-A



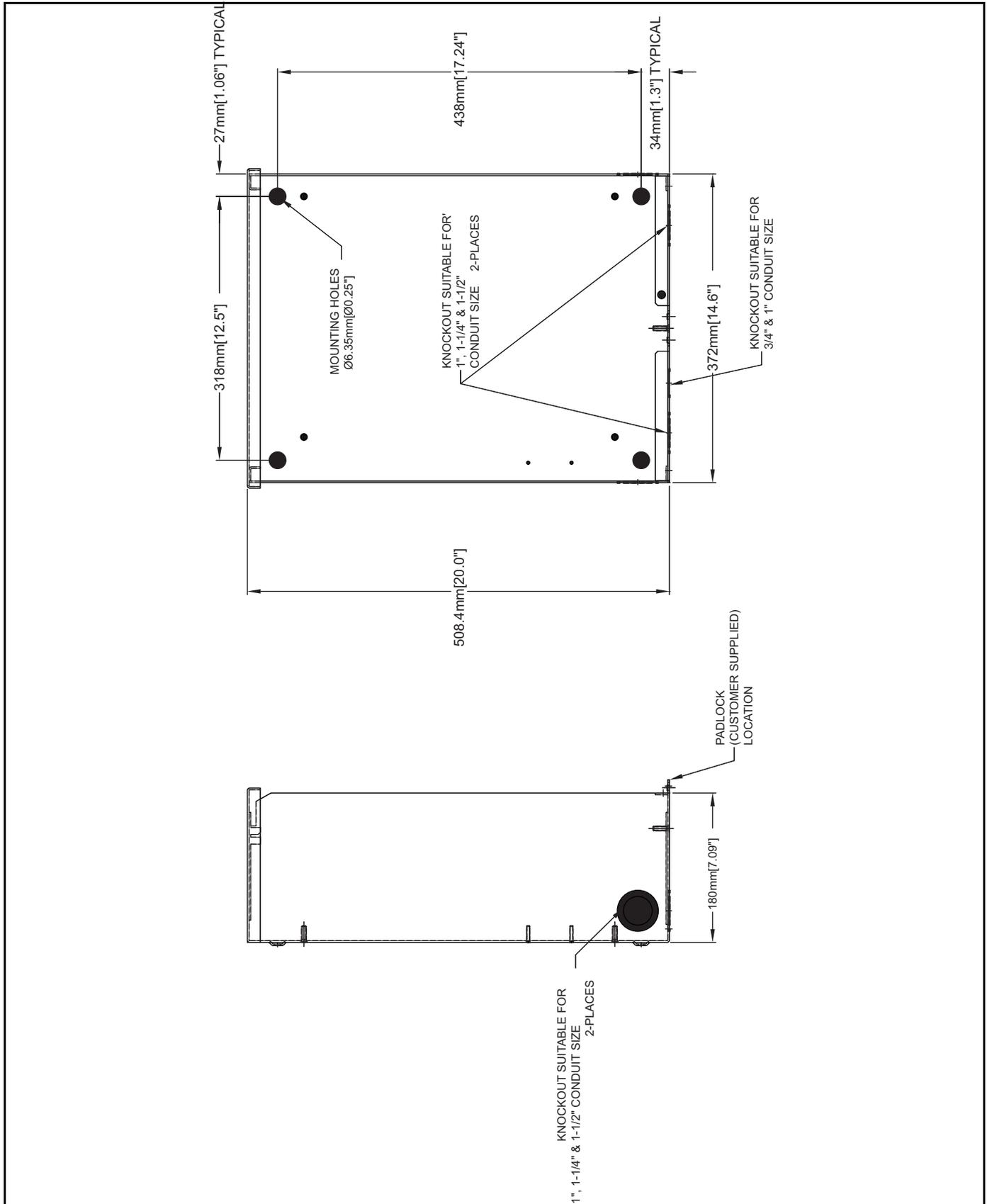
Installation Drawing—RTS 30 x 48

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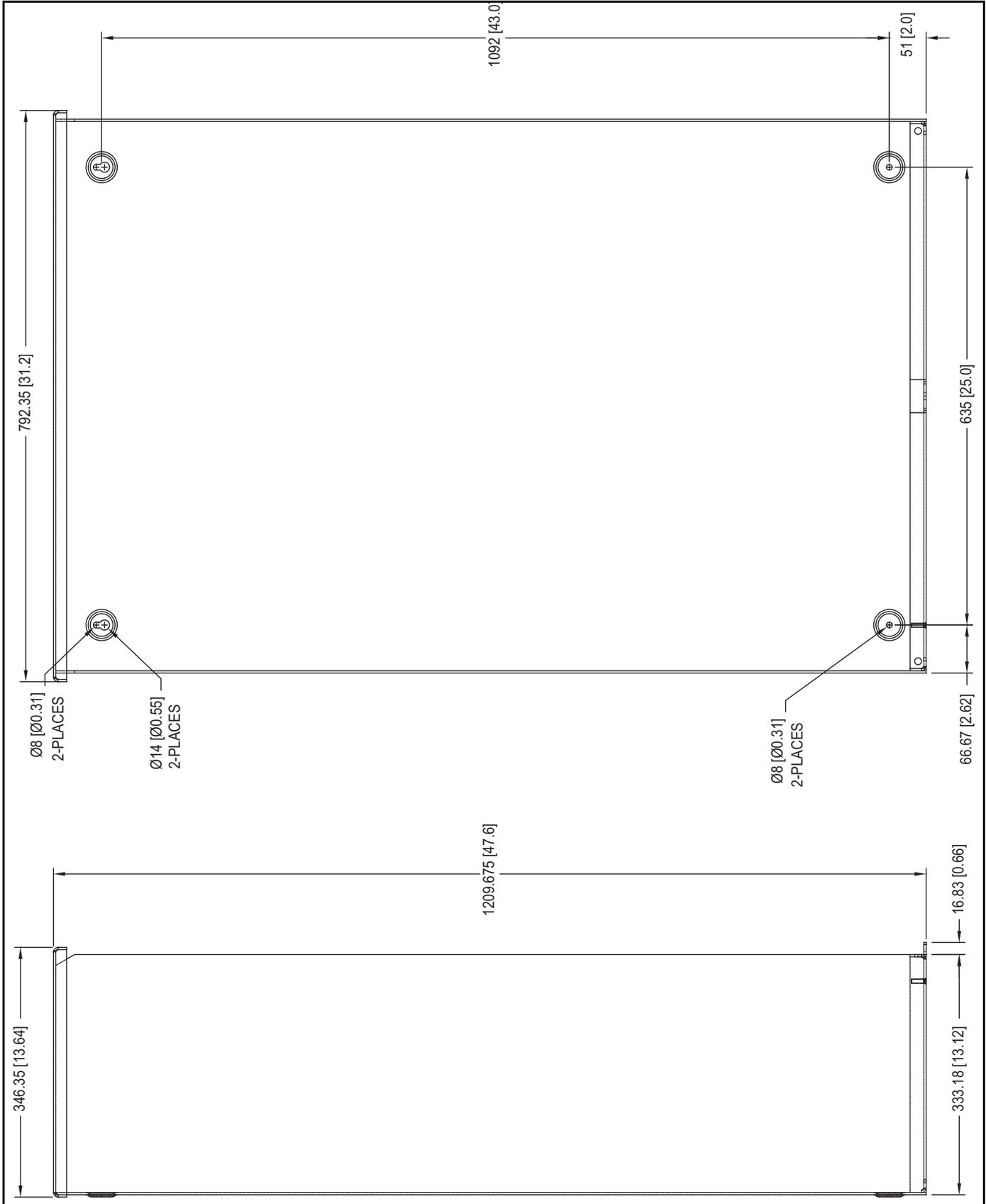
Installation Drawing—100/200A

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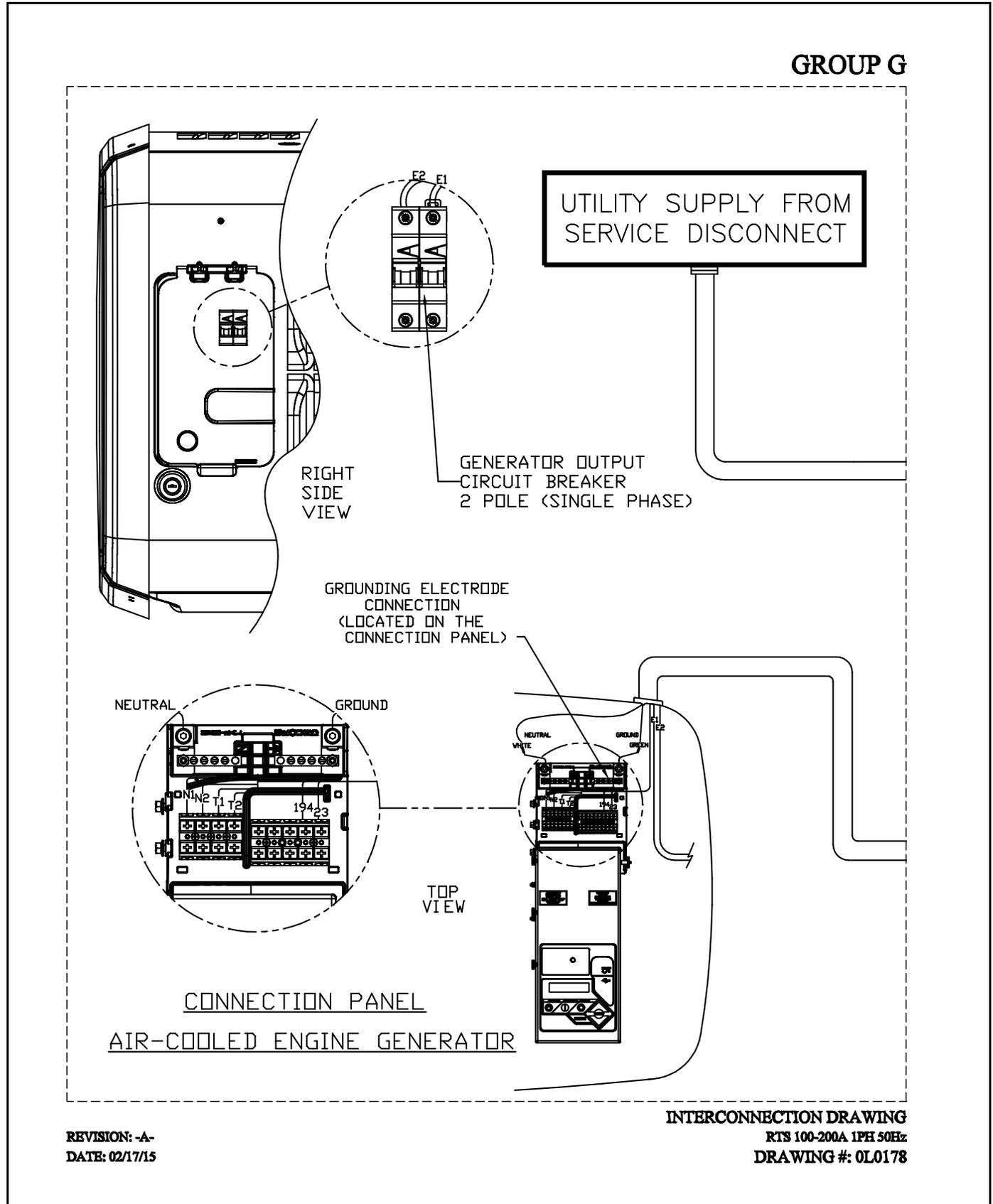
Installation Drawing—400A

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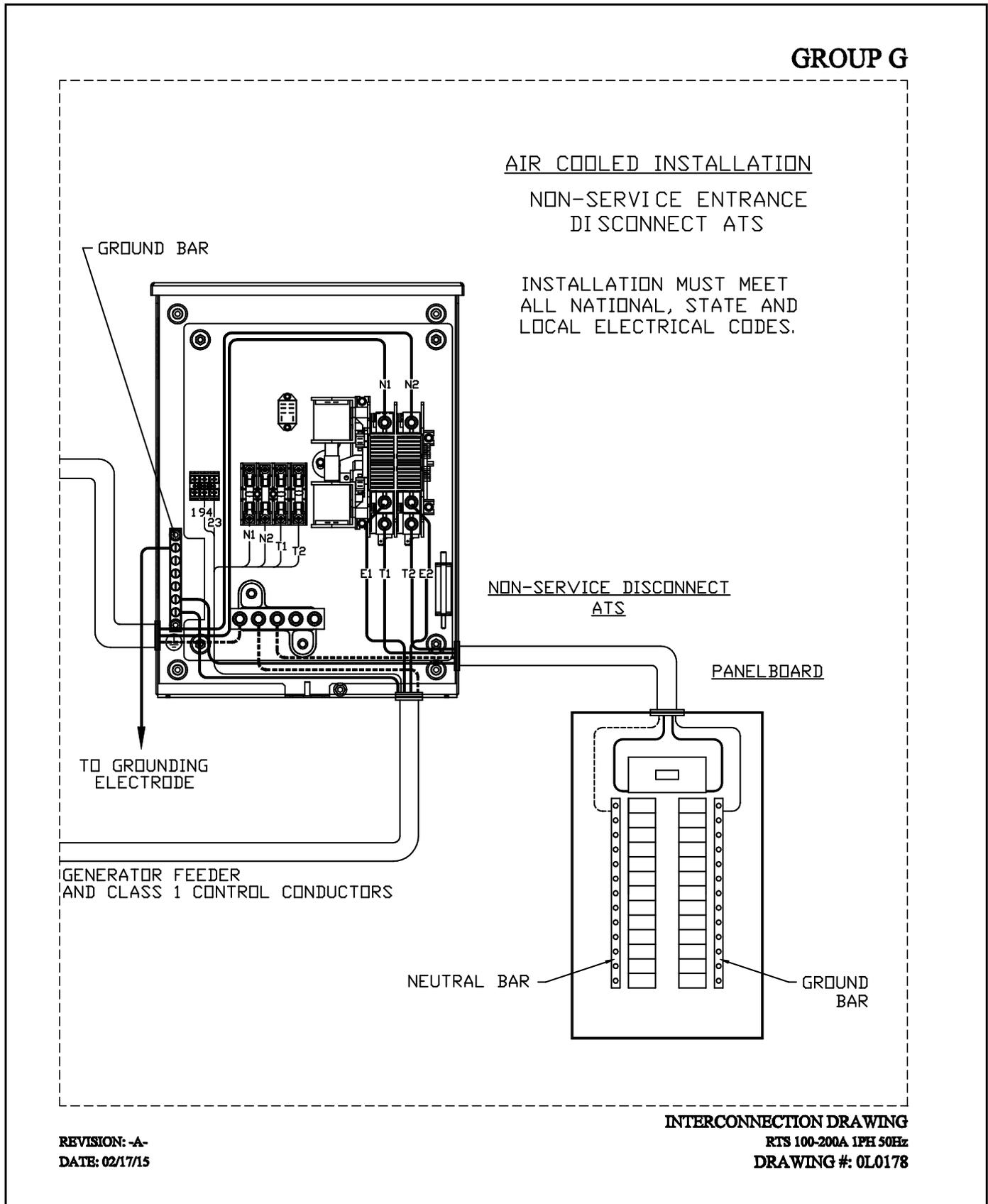
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No. 0L0178-A (Part 1 of 2)



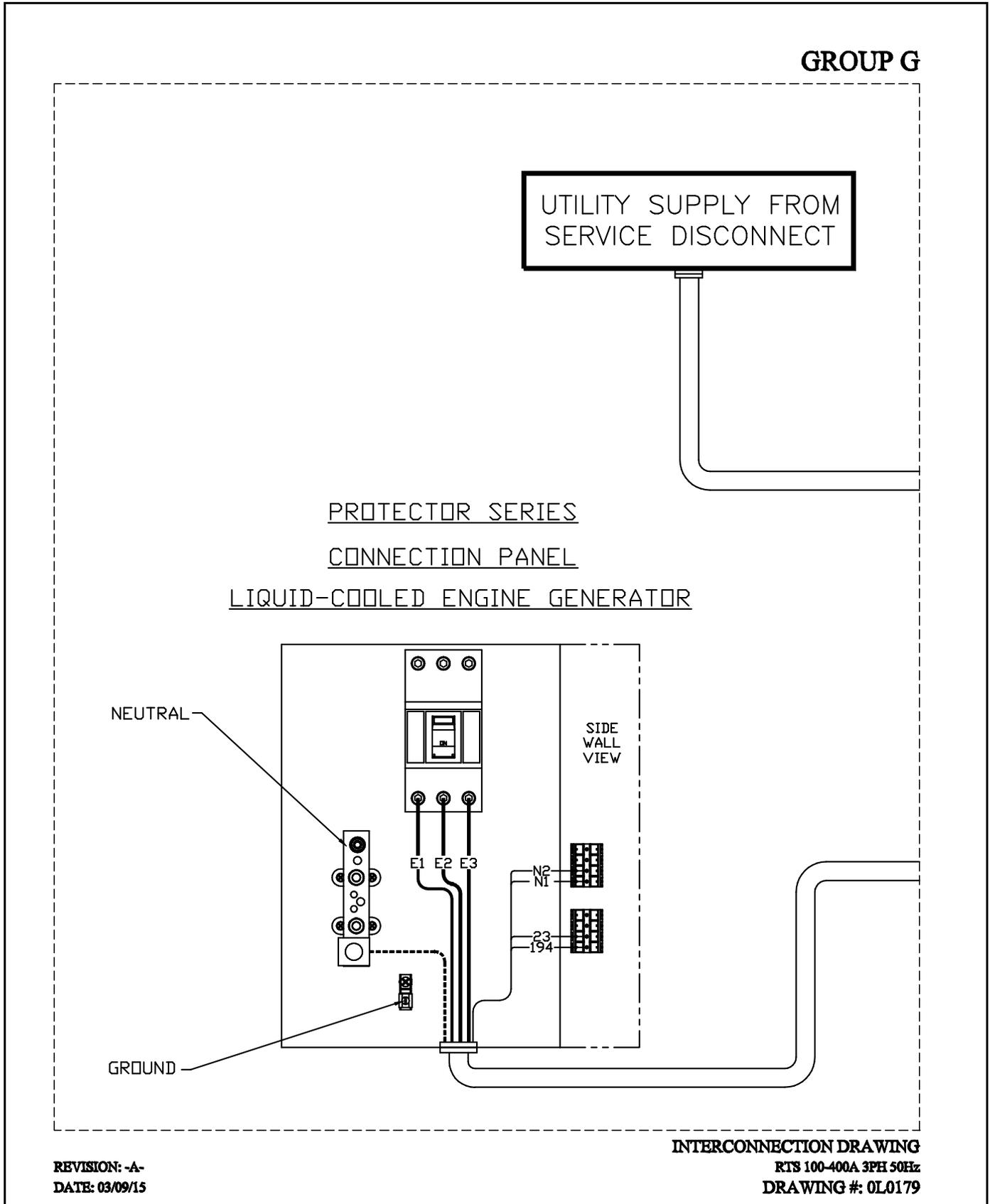
Interconnection Drawing—100/200A 1-phase 50 Hz

No. 0L0178-A (Part 2 of 2)



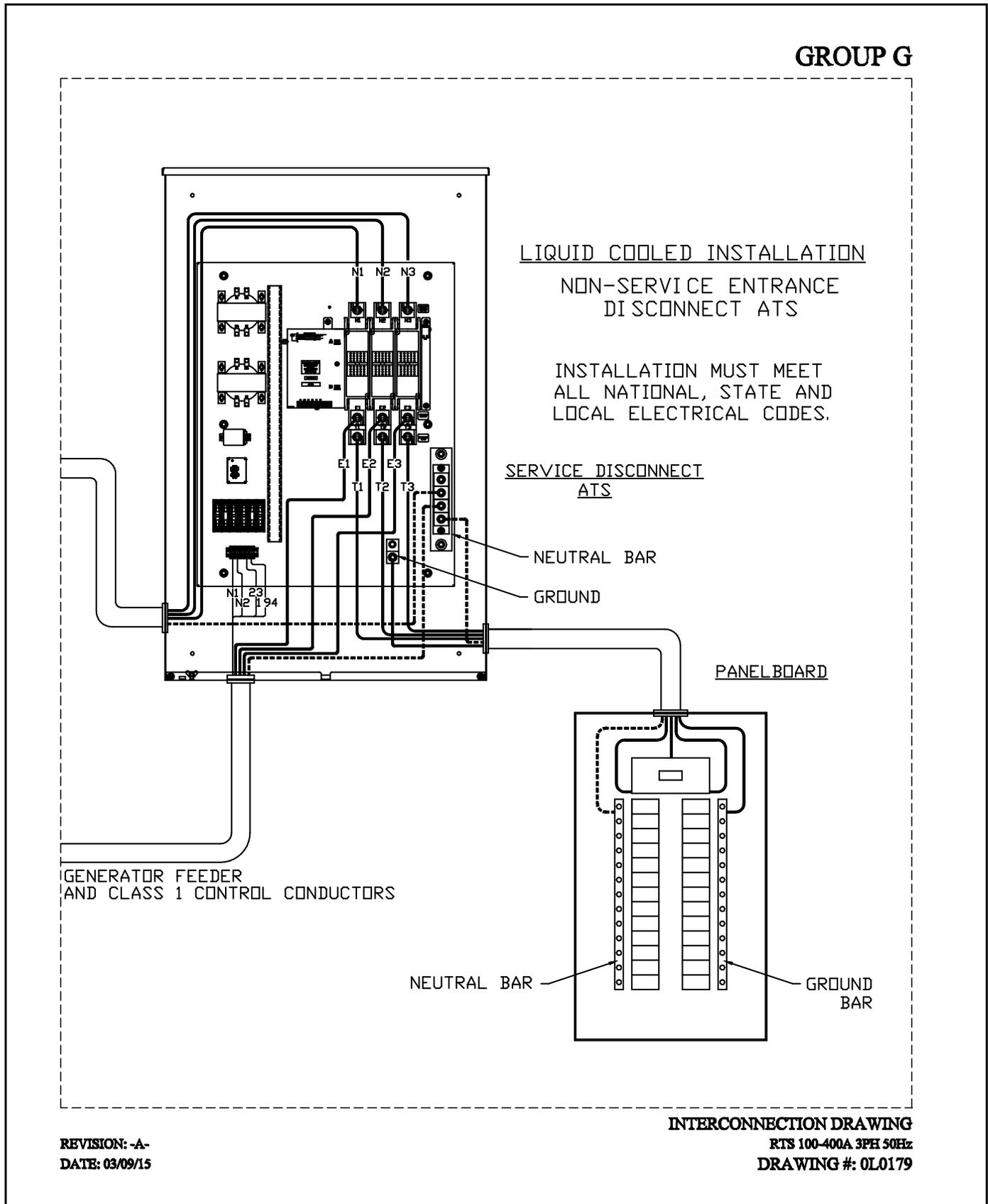
Interconnection Drawing—100-400A 3-phase 50 Hz

No. 0L0179-A (Part 1 of 2)



Interconnection Drawing—100-400A 3-phase 50 Hz

No. 0L0179-A (Part 2 of 2)



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Part No. 0L0176 Rev. C 11/10/2021

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