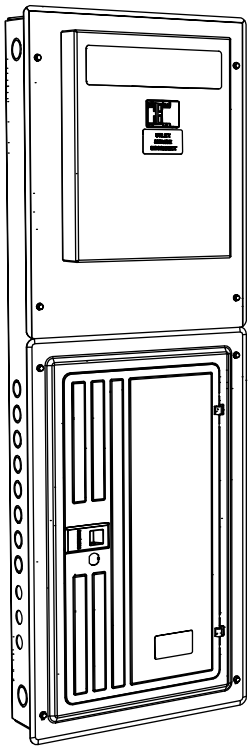
GENERAC®

Owner's Manual

Automatic Transfer Switch

Service Rated, 100-200 Amp, 240V 60 HZ



Register your Generac product at:
WWW.REGISTER.GENERAC.COM
1–888–9ACTIVATE
(1–888–922–8482)

SAVE THIS MANUAL FOR FUTURE REFERENCE

Model:	
Serial:	
Date Purchased:	

Model Number

RXG24SHA1 (100A)

RXG42SHA1 (200A)

⚠ WARNING

CANCER AND REPRODUCTIVE HARM
www.p65warnings.ca.gov

(W000393)

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Section 1: 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 the 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.

(W000100)

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.

(D000001)

⚠WARNING

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

(W000002)

⚠CAUTION

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

(C000003)

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.

Electrical Hazards



DANGER

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

(D000129)



DANGER

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

(D000104)



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.

(D000145)



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.

(D000237)



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.

(D000195)



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.

(D000123)



DANGER

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

(D000157)

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.

(D000191)

DANGER

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

(D000119)

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.

(W000155)

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.

(C000120)

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.

(C000121)

CAUTION

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

(C000134)

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.

(D000237)



⚠DANGER

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

(D000129)



⚠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.

(D000123)



⚠DANGER

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

(D000104)



⚠DANGER

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

(D000188)



⚠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.

(D000213)

⚠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.

(D000191)



⚠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.

(D000145)



⚠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.

(W000209)

⚠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.

(W000247)

- 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; 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, utility service disconnect circuit breaker, a control relay, fuses, terminal strip, and fuse holder for connection of sensing wires.

This transfer switch is suitable for use as service equipment.

Transfer Switch Mechanism

See ***Figure 2-1***. These switches are used with a single-phase system, when the single-phase NEUTRAL line is to be connected to a neutral lug and is not to be switched.

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.

This UL listed transfer switch is for use in optional standby systems only (NEC article 702).

A 100A rated switch is suitable for use on utility services capable of delivering not more than 10,000 RMS symmetrical amperes, 240 VAC maximum. A 200A rated switch is suitable for use on a utility service capable of delivering not more than 22,000 RMS symmetrical amperes, 240 VAC maximum when utilized with Siemens and Murray branch circuit breakers, and suitable for use on utility services capable of 10,000 RMS symmetrical amperes, 240 VAC maximum when utilized with Eaton and Square D Homeline branch circuit breakers.

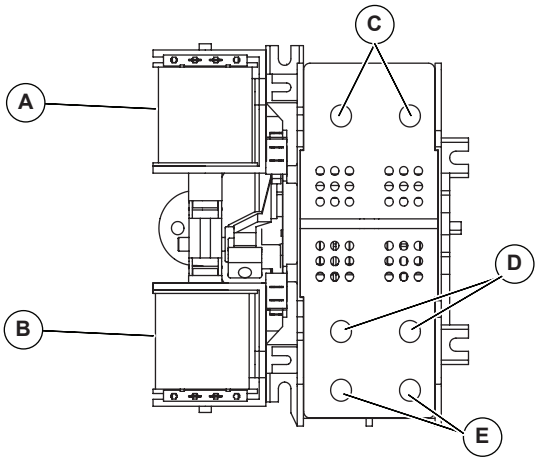


Figure 2-1. Typical Single-Phase ATS Transfer Mechanism

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

Load Center Circuit Breakers

This switch is listed for use with the following one inch breakers:

Manufacturer	SCCR Amperage Rating
Siemens	22 kA (200A) 10 kA (100A)
Murray	
Eaton	10 kA (100A and 200A) including GFCI, AFCI and tandem breakers up to 50 amps
Square D Homeline	

NOTE: For branch circuits and feeders over 50 amps, only listed Siemens or Murray circuit breakers shall be used.

Service Disconnect Breaker and Terminal Ratings

Breaker Specification		
Description	Siemens MBK-100A Type EQ8681 or MBK-200A Type EQ8695 2-pole, Single Phase	
Voltage / Amp Rating	120/240 VAC, 100A or 200A (80% Continuous Current Rated)	
Frequency	60 Hertz	
100 Amp Utility Service and Disconnect Breakers		Tightening Torque
Utility Connection	#4 - #3/0 AWG (Cu/Al)	55 in-lbs. (6.2 Nm)
Generator / Load Connection	#14 - 1/0 (Cu/Al)	50 in-lbs. (5.6 Nm)
Neutral / Ground Bars	10-14 Cu/10-12 Al	20 in-lbs. (2.3 Nm)
	8 AWG	25 in-lbs. (2.8 Nm)
	6-4 AWG	35 in-lbs. (4.0 Nm)
Ground Conductors Only	(2) or (3) 14 AWG	20 in-lbs. (2.3 Nm)
	(2) 12-10 AWG	20 in-lbs. (2.3 Nm)
Control Wiring		11 in-lbs. (1.2 Nm)
200 Amp Utility Service and Disconnect Breakers		Tightening Torque
Utility Connection	#1 - 300MCM(Cu/Al)	250 in-lbs. (28.2 Nm)
Generator / Load Connection	#6 - 250MCM (Cu/Al)	275 in-lbs. (31.0 Nm)
Neutral	#4 - 2/0	40–50 in-lbs. (4.5–5.6 Nm)
Ground	(2) or (3) 14 AWG	20 in-lbs. (2.3 Nm)
	(2) 12-10 AWG	20 in-lbs. (2.3 Nm)
Control Wiring		11 in-lbs. (1.2 Nm)

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) and UL Type 1, intended for indoor installation only.

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.

(W000100)

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 that a copy of the ***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.

Three 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
- UL 67; Panelboards Marking and Application Guide

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

Load Management Options

Load management systems are designed to work together to prevent a generator from being overloaded by large appliance loads. A Smart A/C Module (SACM) is provided as standard equipment with this switch. An optional Smart Management Module (SMM) is also available.

Smart A/C Module (SACM)

Up to four air conditioner loads can be managed by the SACM. The SACM manages the loads by “shedding” the connected loads in the event of a drop in generator frequency (overload). Loads to be “shed” are in 4 priority levels on the module.

See ***Figure 2-2***. Priorities A/C 1-4 (A) have connections for an air conditioner. To control an air conditioner, no additional equipment is required. Internal normally closed relays interrupt the 24 VAC thermostat control signal to disable the air conditioner load.

Four LEDs, located on the SACM (B), illuminate when a load is connected and powered.

See ***Figure 2-2***. The SACM has a test button (C) used to simulate an overload condition. This button operates even when the transfer signal is inactive. The Generator Control Wiring is connected to terminals (D).

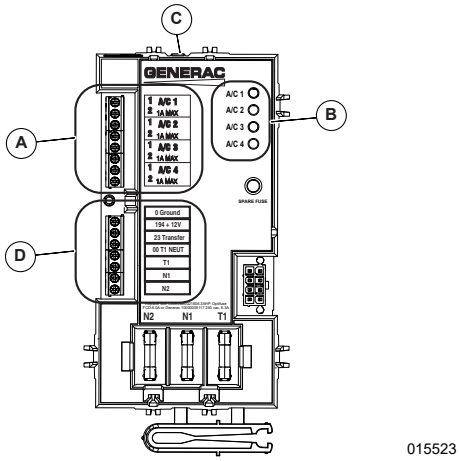


Figure 2-2. Smart A/C Module (SACM)

Smart Management Module (SMM) (sold separately)

Any loads, including central air conditioners, can be managed using a Smart Management Module (SMM). The system can accommodate up to eight individual SMMs.

NOTE: SMMs are self-contained and have individual built-in controllers.

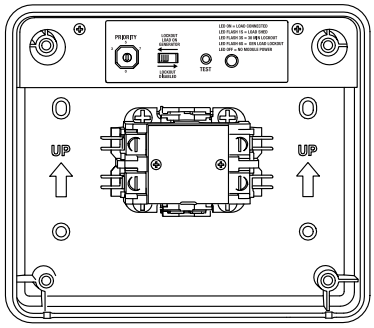


Figure 2-3. Smart Management Module (SMM)

Application Considerations

Generator overload condition is determined by generator frequency. Loads are shed when frequency is less than 58 Hz for three seconds or less than 50 Hz for ½ second (for 60 Hz systems).

The SACM can be used in conjunction with individual SMMs to manage a combined total of eight loads.

- Use Priorities A/C 1-4 on the SACM as the top priorities, then up to four SMMs as Priorities 5-8.
- Use only select A/C priorities on the SACM as the top priorities, then use additional SMMs as the remaining priorities.
- A SMM can share a priority with an A/C priority on the SACM provided the generator is sized to handle the combined surge load from both appliances. Sharing priorities can allow up to 12 loads to be managed in a properly sized system.

In any combination of modules, the recovery times after a loss of utility power or shutdown due to overload are shown in ***Table 2-1*** .

Table 2-1. Priority Settings

Priority	Recovery Time	SACM	SMM
1	5 minutes	Yes	Yes
2	5 minutes 15 seconds	Yes	Yes
3	5 minutes 30 seconds	Yes	Yes
4	5 minutes 45 seconds	Yes	Yes
5	6 minutes	NA	Yes

Priority	Recovery Time	SACM	SMM
6	6 minutes 15 seconds	NA	Yes
7	6 minutes 30 seconds	NA	Yes
8	6 minutes 45 seconds	NA	Yes

Refer to the SMM Owner's/Installation Manual for detailed characteristics and specifications of that product.

Section 3: Installation

Introduction to Installation

Though this equipment has been wired and tested at the factory, the installer should verify all wiring connections are proper. Installing the switch includes the following procedures:

- Mounting the enclosure.
- Connecting power source and load leads.
- Connecting the generator start and sensing circuit.
- Connecting any auxiliary contact (if needed).
- Testing functions.

Mounting

DANGER

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

(D000119)

Mounting dimensions for the transfer switch enclosure are in this manual. Enclosures are typically wall-mounted. See ***Drawings and Diagrams***.

This transfer switch is mounted in a NEMA 1 type enclosure. It can only be mounted indoors 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.

Line Terminal Barriers

See ***Figure 3-1***. The 2017 update of UL67 (Standard For Panelboards) and NEC Article 408.3 (A) (2) require line terminal barriers (D) on the utility side of the main service breaker. These “Touchsafe” barriers help to protect the installer and field service technicians from accidentally contacting live circuit parts only when the Service Disconnect Circuit Breaker is OFF.

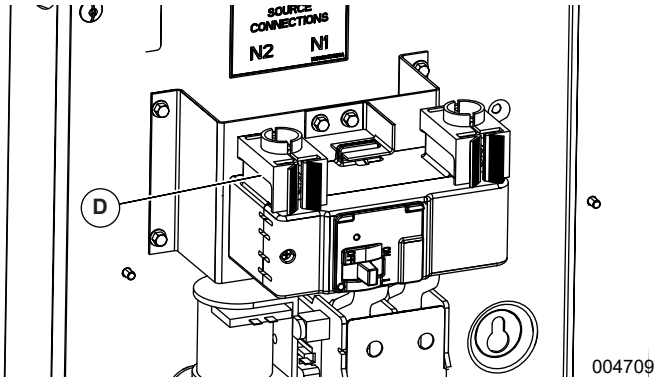


Figure 3-1. Line Terminal Barriers

IMPORTANT NOTE: Line terminal barriers must not be removed by the installer. Instead, flex wires out of the way to torque lugs for N1 and N2 wires.

Replace missing or damaged line terminal barriers. Order Siemens Kit ECLTB1 (MBK100A breaker) or ECLTB2 (MBK200A breaker).

Connecting Power Source and Generator Power Supply

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.

(D000116)

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.

1. Connect utility supply at the utility service disconnect circuit breaker terminals.
2. Connect loads to the Integrated Load Center with customer-supplied circuit breakers.
3. See ***Figure 2-1***. Connect generator to the generator terminals (E1 and E2) on the transfer mechanism.
4. Connect the generator neutral wire to the top neutral lug or side lugs on the panelboard. An additional neutral lug kit is available for installation in the field if needed. The kit is pre-assembled on the 200A panelboard, and can be ordered as an accessory for the 100A panelboard under Generac P/N 10000006293 or Siemens P/N ECLK2.

5. Connect neutral conductors to the lugs and terminals along the neutral/ground bars in the panelboard section of the transfer switch.
6. Connect grounding electrode conductors to the neutral terminal bars in the panelboard portion of the switch.

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 provided knockouts. Additional knockouts into the enclosure can be made in the field as needed.

NOTE: Cover and protect the transfer switch and breakers while removing knockout slugs. Avoid dropping slugs or metal chips into the enclosure.

Conduit entry shall maintain the proper wire bending spaces required by Tables 312.6 (A) and (B) in the NEC. 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.

⚠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.

(C000120)

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.

Install Branch Breakers

1. See ***Figure 3-2***. Remove screws from front panel assembly (A).

   NOTE: There are four screws on the front panel assembly on 100A models; six on 200A models.
2. Remove front panel assembly, and open door to expose breaker knockouts (B). Remove knockouts required for selected breaker installation.

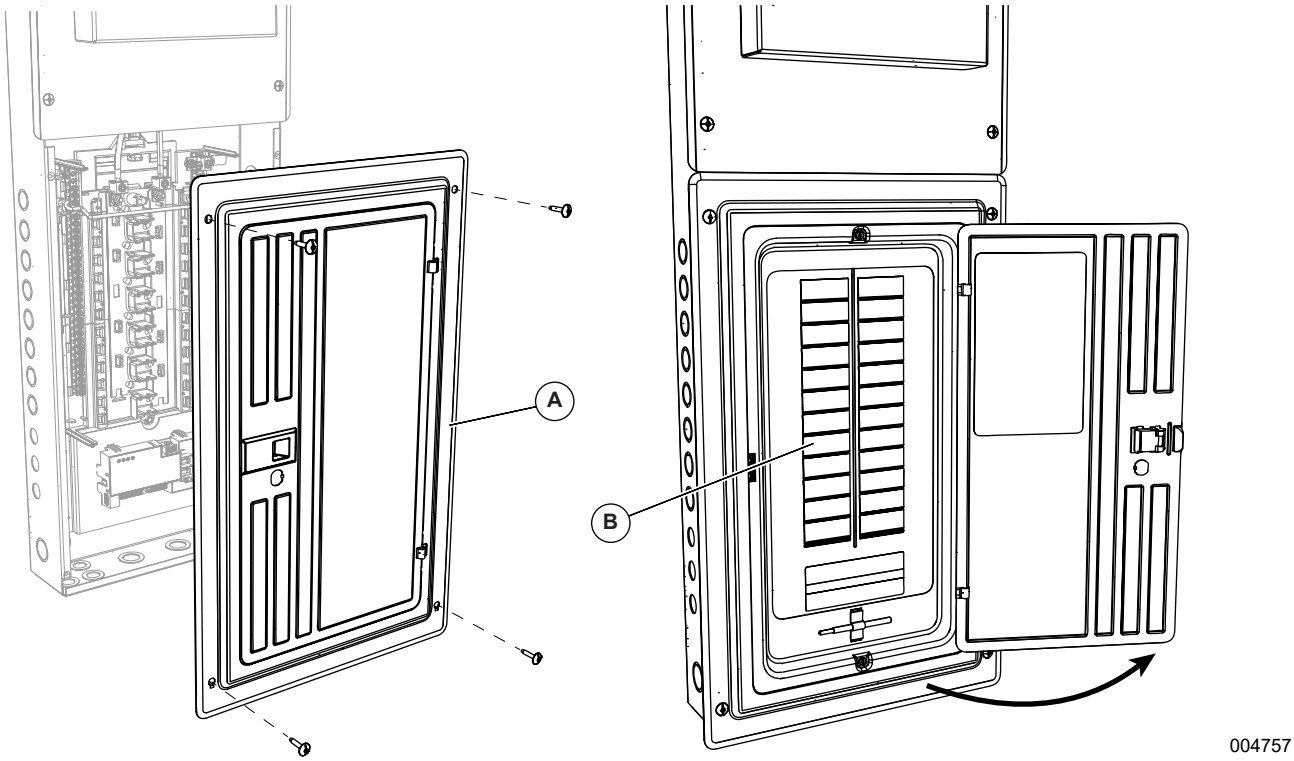


Figure 3-2. Front Panel Assembly and Breaker Knockouts

3. After removing knockouts, install front panel assembly and secure with screws.
4. See ***Figure 3-3***. Insert tab on each breaker (A) into the hook on the bus (B). Push the breaker into the bus until it snaps into place.

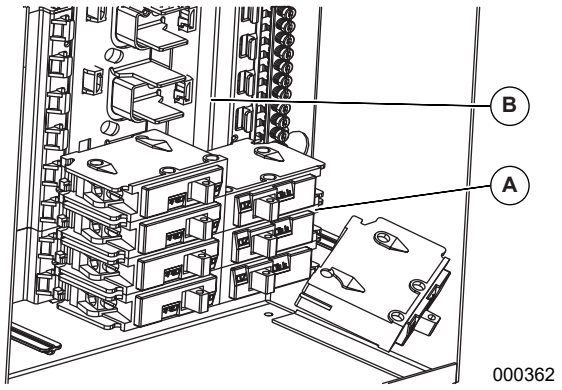


Figure 3-3. Install Breakers

5. See ***Figure 3-4***. Apply provided circuit directory labels (C) and mark each circuit accordingly with a pen.

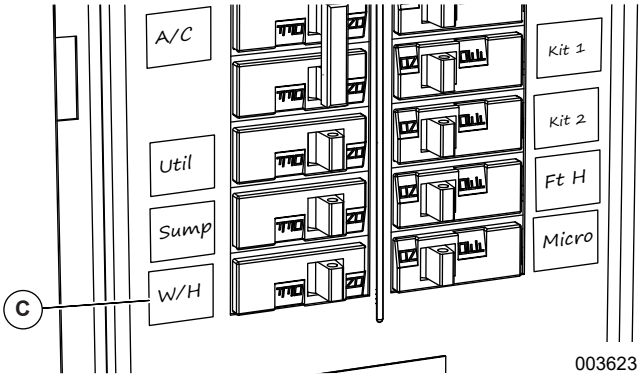


Figure 3-4. Label Breakers

Installing Branch Circuit Conductors

1. Install properly sized branch circuit conductors into the transfer switch through the knockouts provided. Additional knockouts can be made in the field as needed.
2. Connect the ungrounded branch circuit conductors (hot conductors) to a properly sized circuit breaker approved for use with the transfer switch.
3. Terminate the neutral conductor and equipment grounding conductor of the branch circuit at the neutral/equipment ground terminal bars.
4. Size all conductors, raceways, conduits, and junction boxes, if required, to the applicable NEC code articles and follow the NEC installation requirements for the wiring method(s) selected.

NOTE: Multi-wire branch circuits must be installed in accordance with NEC Article 210.4.

Connecting Start Circuit Wires

Control system interconnections consist of 0, 194, 23, 00, T1, N1, and N2.

NOTE: To simplify installation, Generac Composite Tray Cable control wiring color codes match the label on the SACM control module shown in ***Figure 3-5***.

The generator control wiring is a Class 1 signaling circuit. Reference instruction manual of specific engine generator for wiring connection details. Screw heads are straight bladed and cross-bladed, and should be tightened to 3.5 in-lb (0.4 Nm).

Recommended wire gauge sizes depend on wire length as specified in the following chart: Consult factory if you are operating more than one transfer switch and SACM.

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

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).

Connecting SACM

See ***Figure 3-5***. The SACM can control an air conditioner (24 VAC) directly.

Control of Air Conditioner Load

1. Route the thermostat cable (from the furnace/thermostat to the outdoor air conditioner unit) to the transfer switch.
2. See ***Figure 3-5***. Connect the wire to the terminal strip terminals (A/C 1) on the SACM. These are normally closed contacts which open upon load shed conditions. Route thermostat wire away from high voltage wires.
3. If required, connect additional air conditioners to the terminal strip terminals (A/C 2-4).

Contact Ratings	
A/C 1-4	24 VAC, 1.0 Amp Max

NOTE: These instructions are for a typical air conditioner installation. Control of certain heat pumps and 2-stage air conditioners may require special connections or the use of SMMs to control the loads.

Typical SACM Connections

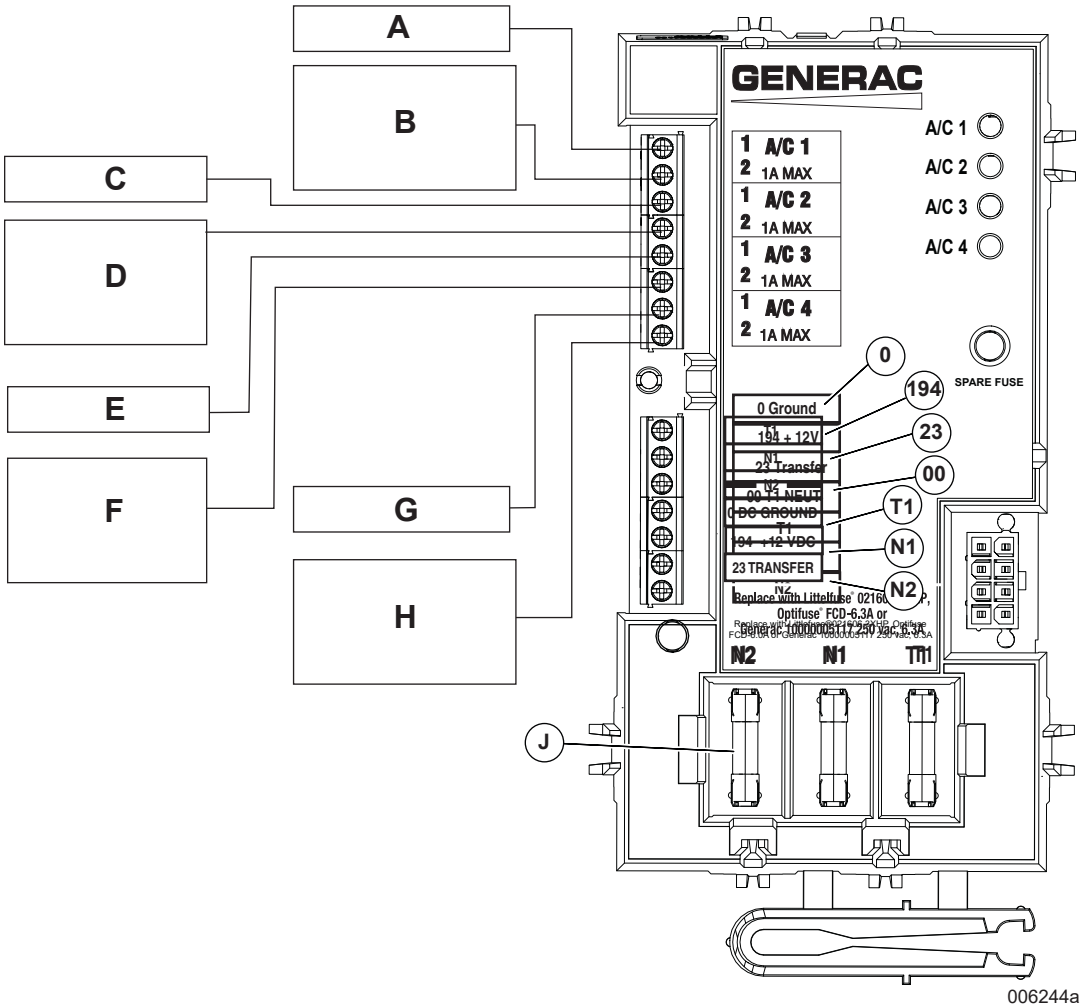


Figure 3-5. Typical SACM Connections

A Thermostat 1	
B Air Conditioner 1	
C Thermostat 2	
D Air Conditioner 2	
E Thermostat 3	
F Air Conditioner 3	
G Thermostat 4	
H Air Conditioner 4	
0 DC Ground	
194 + 12 VDC	
23 Transfer Control	
00 Dedicated T1 Neutral	
T1 (fused) Battery Charge	
N1 (fused) Utility Sense	
N2 (fused) Utility Sense	
J 240 VAC, 6.3A Fuses	

Auxiliary Contact

See ***Figure 3-6***. If desired, there is one normally-closed Auxiliary Contact (A) 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. If needed, an extra auxiliary contact can be added.

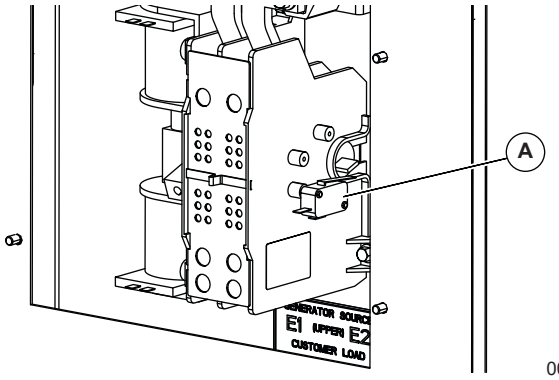


Figure 3-6. Auxiliary Contact

The auxiliary contact is normally closed when the transfer switch is in utility mode. The contacts will open when the transfer switch is in the standby power mode.

NOTE: Auxiliary Contact is rated 10 amps at 125 or 250 volts AC, and 0.6 amps at 125 volts DC.

⚠CAUTION

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

(C000134)

Fault Current Label

See ***Figure 3-7***. A Fault Current Identification Label is provided in the bag containing the unit Owner's Manual and transfer switch manual operating handle. The 2017 NEC requires that the short-circuit current rating of the transfer equipment, based on the type of overcurrent protective device protecting the transfer equipment, be field marked on the exterior of the transfer equipment. For NEC compliance, verify the required short-circuit current rating of the transfer switch before installation. The completed label provides the local AHJ (Authority Having Jurisdiction) with the information he or she may require during inspection.

Apply the label to the exterior of the transfer switch enclosure. Use a pen to fill in the required information, and then cover the label with the clear protective decal.

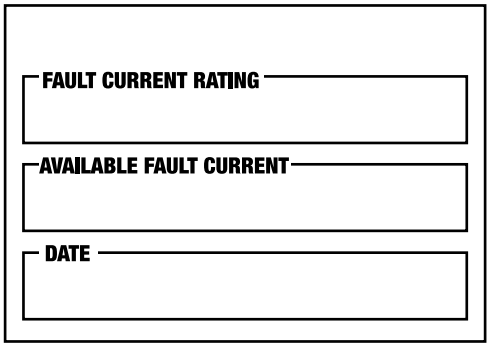


Figure 3-7. Fault Current Label

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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 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.

⚠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.

(C000121)

IMPORTANT NOTE: 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

⚠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.

(D000132)

See ***Figure 4-1***. A yellow manual handle is shipped with the transfer switch and is located in the bag containing the owner's manual. A retaining clip (A) inside the transfer switch enclosure stores the manual handle when not in use.

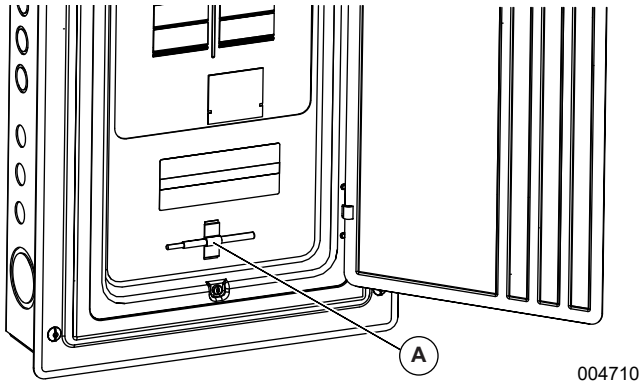


Figure 4-1. Manual Handle Storage

Manual operation must be checked BEFORE the transfer switch is operated electrically. To check manual operation, proceed as follows.

IMPORTANT NOTE: Never manually operate the transfer switch mechanism while it is energized with utility or generator power.

1. Confirm the generator is OFF.
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 as shown in , with the upper cover removed. The top of the movable 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.

(C000122)

Close to Utility Source Side

See ***Figure 4-2***. Before proceeding, verify the position of the switch by observing the position of 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 movable contact carrier arm (B), 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 movable contact carrier arm. Return handle to retaining clip.

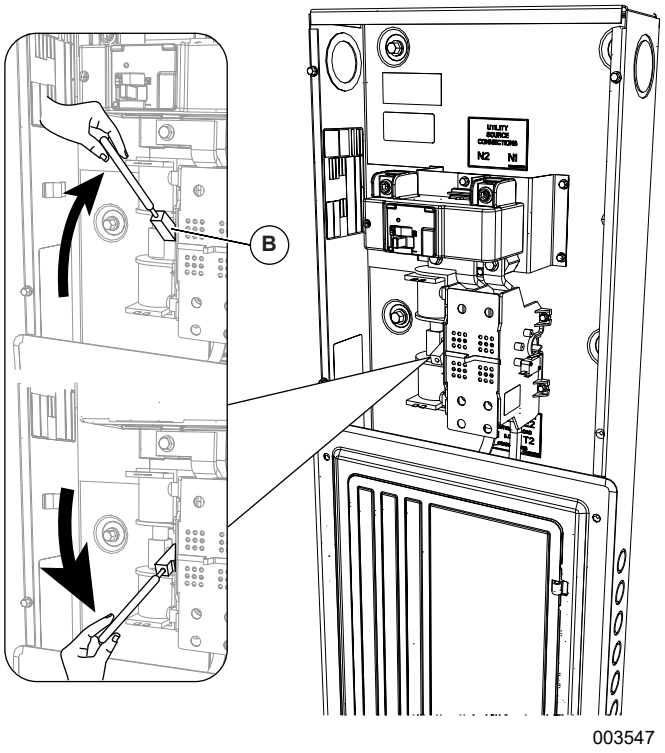


Figure 4-2. Manual Operation

Close to Generator Source Side

See ***Figure 4-2***. 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 movable contact carrier arm (A), 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 movable contact carrier arm. Return manual operating handle to storage bracket (B).

Return to Utility Source Side

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

Voltage Checks

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.

(D000129)

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; N1 to NEUTRAL and N2 to NEUTRAL.

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.

(D000129)

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's main circuit breaker (CB1) to its ON or CLOSED position.
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.

Frequency	60–62 Hz
Terminals E1 to E2	240–246 VAC
Terminals E1 to NEUTRAL	120–123 VAC
Terminals E2 to NEUTRAL	120–123 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.

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 of the transfer switch to OFF or OPEN, and turn OFF or OPEN all load circuit breakers.
3. Manually actuate the transfer switch main contacts to the emergency (standby) position. See ***Manual Operation***.
4. To start the generator, select the MANUAL mode of operation. When engine starts, let it stabilize for a few minutes, and close lid (if applicable).
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:
   a. Turn on electrical loads to the full rated wattage/amperage capacity of the generator. DO NOT OVERLOAD.
   b. With maximum rated load applied, check voltage and frequency across transfer switch terminals E1 and E2. Voltage should be greater than 230 VAC (240 VAC system); frequency should be greater than 59 Hz.
   c. Verify that the gas pressure remains within acceptable parameters (see the generator Installation manual).
   d. Let the generator run under rated load for at least 30 minutes. With unit running, watch for unusual noises, vibration, or overheating 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***. Handle and operating lever of transfer switch should be in down position.
9. Set the utility service disconnect circuit breaker of the transfer switch to ON or CLOSED.
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 OFF.
2. Set the utility service disconnect circuit breaker of the transfer switch to OFF or OPEN.

   NOTE: The Utility Power Circuit Breaker in the transfer switch must be turned OFF to simulate a utility outage. Shutting off the main disconnect in a subpanel connected to the transfer switch will NOT simulate an outage.
3. Verify switch is de-energized.
4. Install front cover of the transfer switch.
5. Set the utility service disconnect circuit breaker of the transfer switch to ON or CLOSED.
6. Set the generator main circuit breaker to ON.
7. On the generator panel, select AUTO. The system is now ready for automatic operation.
8. Set the utility service disconnect circuit breaker of the transfer switch to OFF or OPEN.

With the generator ready for automatic operation, the engine should crank and start when the utility source power is turned OFF after a five second delay (factory default setting). After starting, the transfer switch should connect load circuits to the standby side after a five (5) second warm-up delay. Let the system operate through its entire automatic sequence of operation.

NOTE: Timer durations may differ between generators and settings.
With the generator running and loads powered by generator AC output, set the utility service disconnect circuit breaker of the transfer switch to ON or CLOSED. 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 generator should shut down.

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

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.

4. Commissioning may require the local AHJ to verify no voltage is present on the utility side of the transfer switch when the generator is supplying the load. Only a meter with a low impedance setting (LoZ) can accurately measure the voltage. "Ghost" voltages may appear on meters with high input impedance due to capacitive coupling of sensing wires N1 and N2 with the charging voltage from T1. Contact the meter manufacturer for additional information.

Shutting Generator Down While Under Load or During an Extended Outage

⚠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.

(D000191)

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

To turn the generator OFF:

1. Turn the main utility disconnect off.
2. Turn the generator MLCB (generator disconnect) to OFF (OPEN).
3. Allow generator to run and cool down for one minute with no load.
4. Press the OFF mode button on the controller.
5. Remove the 7.5 amp fuse from the control panel.
6. Perform required maintenance procedure(s).

To turn the generator back ON:

1. Install the 7.5 amp fuse in the control panel.
2. Place controller in AUTO. Allow unit to run for one minute with no load.
3. Set MLCB (generator disconnect) on the generator to ON (CLOSED).3
4. Turn main utility disconnect ON (CLOSED).

The system now operates in automatic mode. 10000012870 - S4-12 - Shut Gen DownTo shut the unit off, repeat this complete process.

Testing the SACM

A "Test" pushbutton is provided on top of the SACM to test the operation of the load shed functions. The test pushbutton will work when the ATS is in the utility or the generator position.

Proceed as follows to test the SACM:

1. Turn on the utility supply to the ATS.
2. Verify managed loads are powered and all LEDs illuminate on SACM.
3. Press the TEST button on the SACM.
4. Verify that all of the connected loads to be "shed" become disabled.
5. After five (5) minutes verify A/C 1 is energized and Status LED A/C 1 is ON.
6. After another 15 seconds, verify A/C 2 is energized and Status LED A/C 2 is ON.
7. After another 15 seconds, verify Load A/C 3 is energized and Status LED Load A/C 3 is ON.
8. After another 15 seconds, verify A/C 4 is energized and Status LED A/C 4 is ON.

SACM Fuse Service

See ***Figure 4-3***. A fuse removal and installation tool (A) is included in the SACM housing.

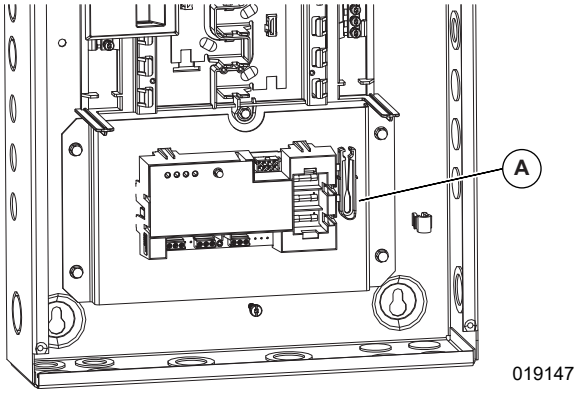


Figure 4-3. Fuse Removal and Installation Tool

If a fuse requires replacement, snap the tool free with an appropriate tool such as diagonal pliers, and use it to replace the fuse. The tool can be stored in the SACM housing retainer directly above the fuses, with the large thumb tab facing out.

Use only Generac replacement fuses — part number 10000005117, rated 240 VAC, 6.3 Amps, 10,000 AIC.

Alternative fuses are Littelfuse® 021606.3MXP or Optifuse® FCD-6.3.

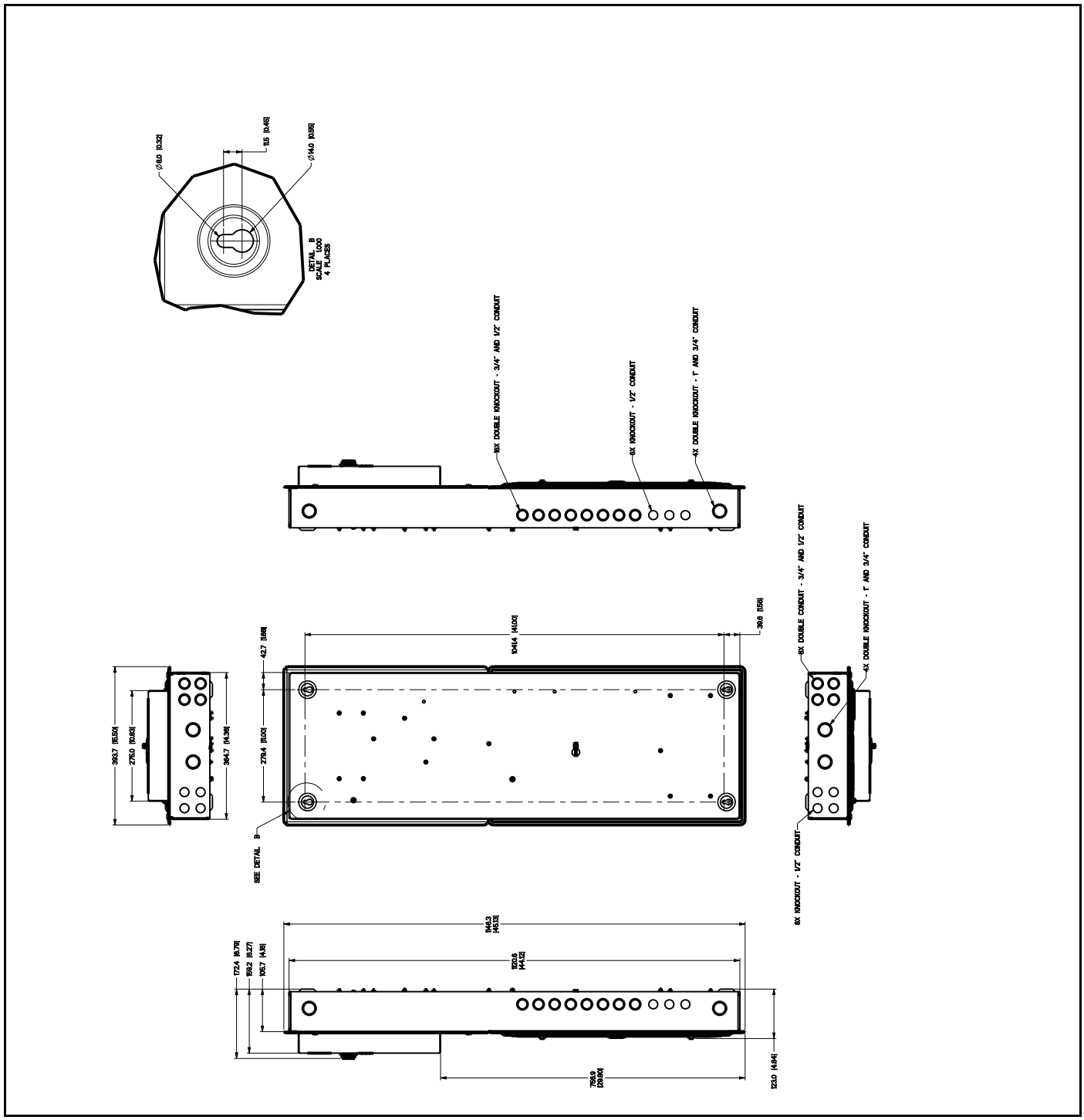
Testing the SMM

Refer to the SMM Owner's/Installation Manual for testing procedure.

Section 5: Drawings and Diagrams

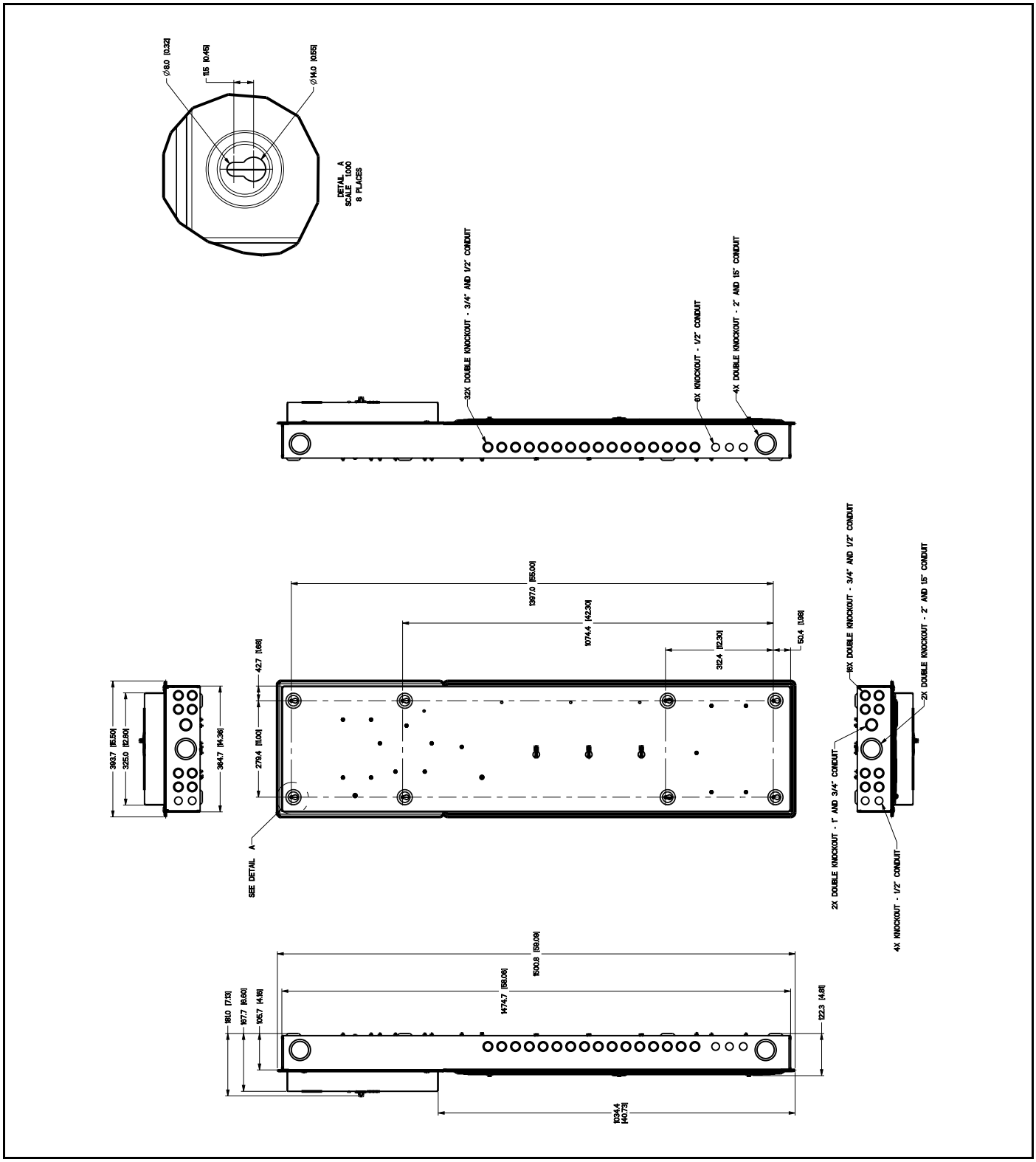
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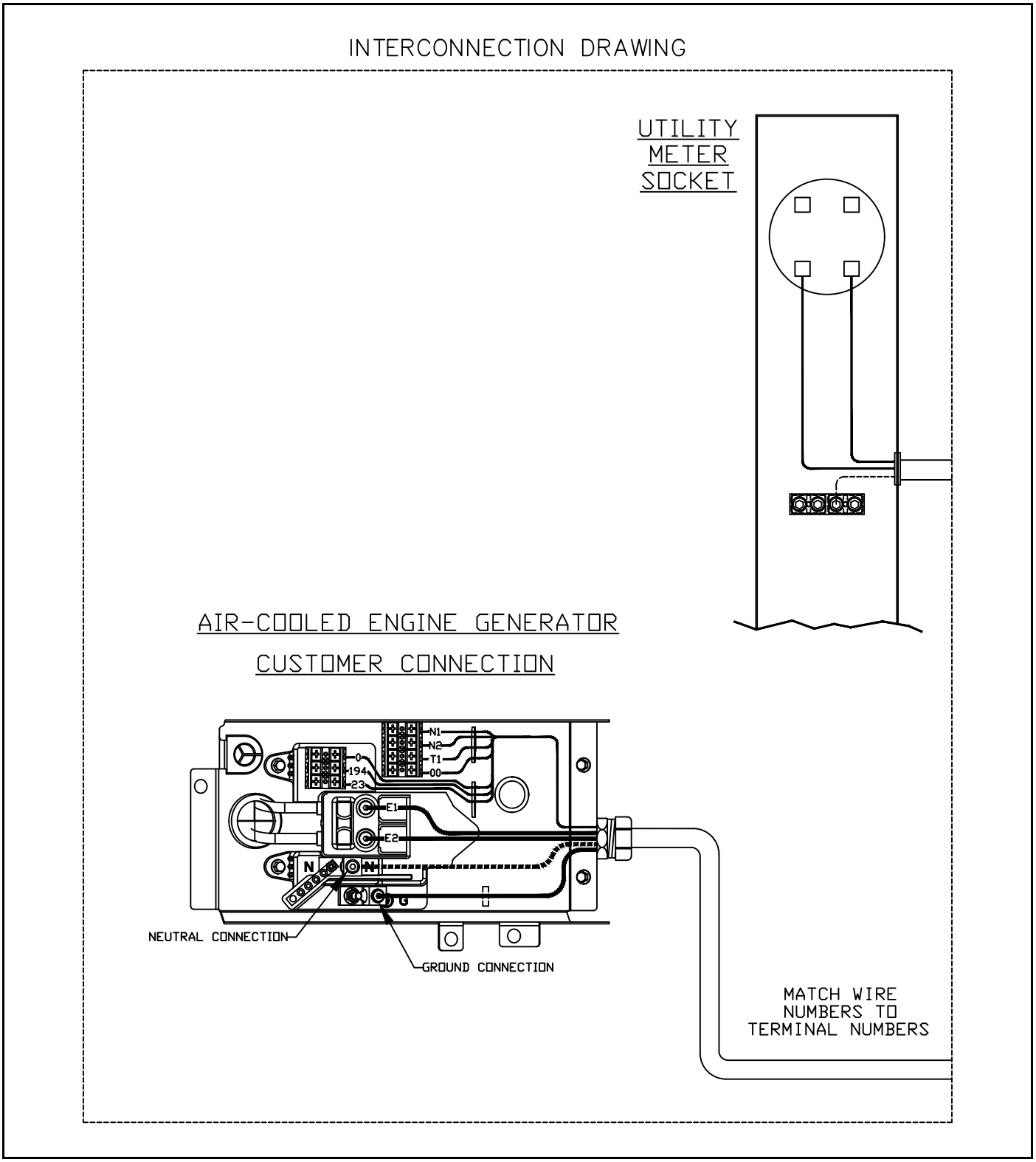
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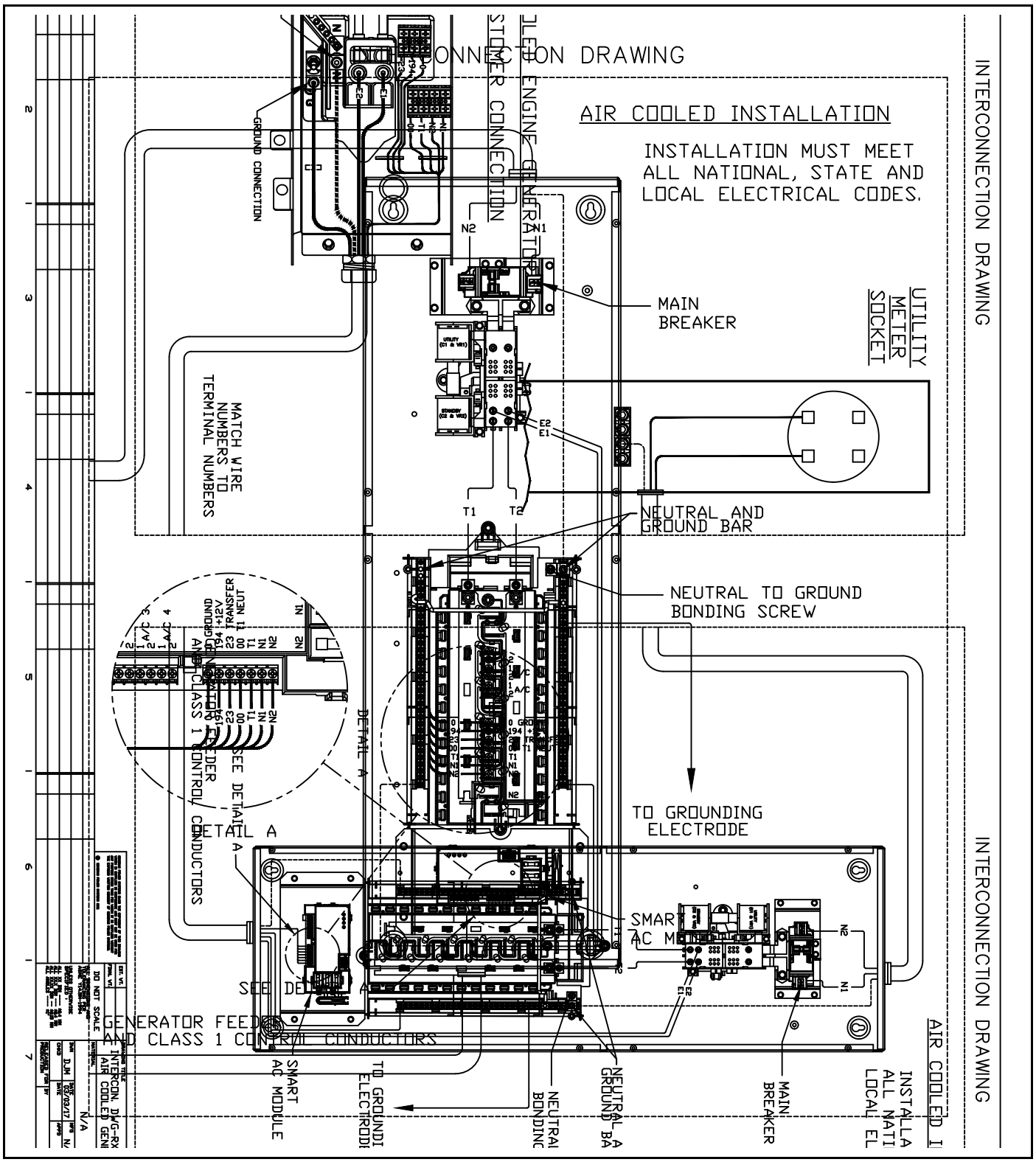
Interconnection Drawings—Air-Cooled Generator 100A

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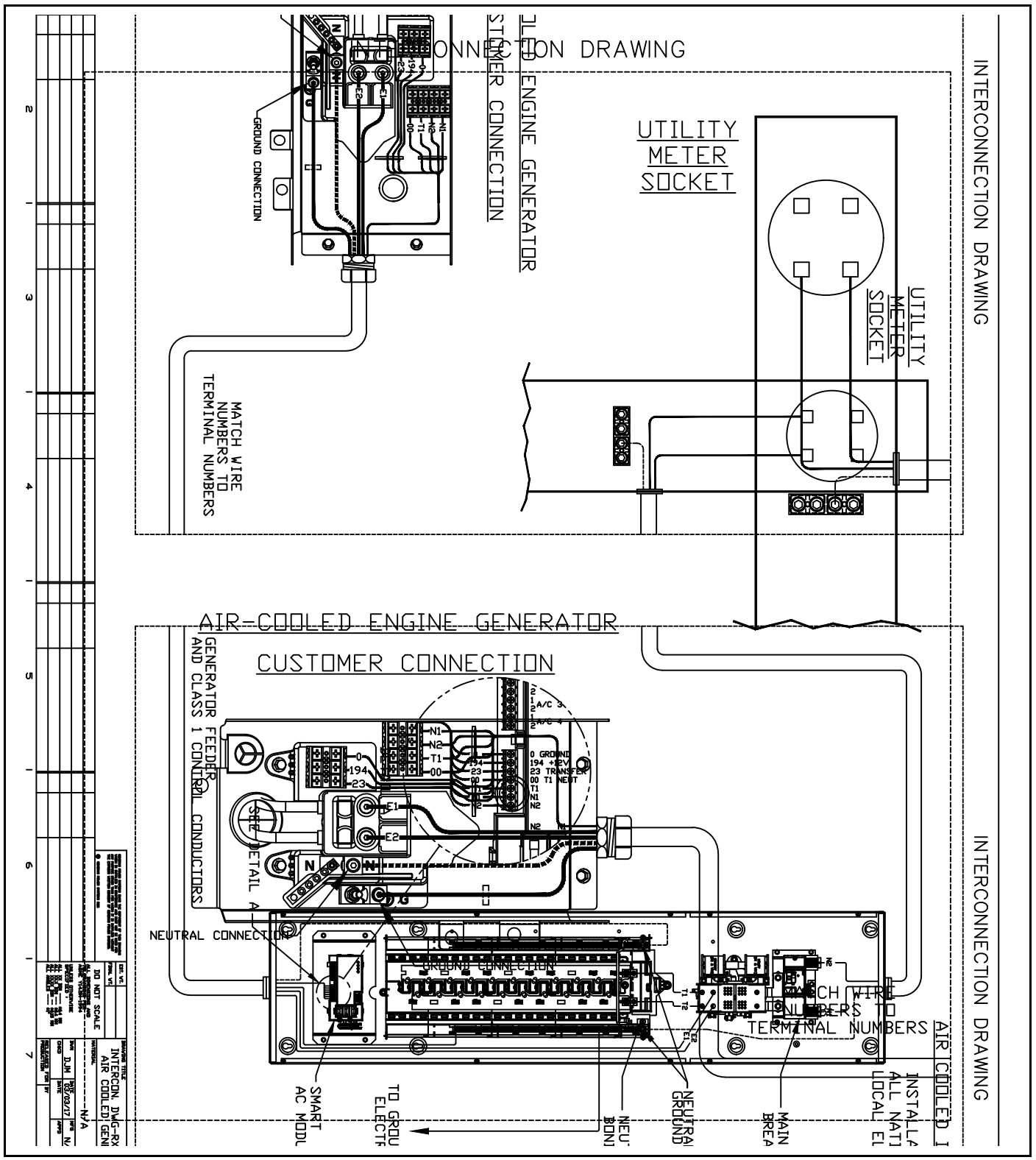
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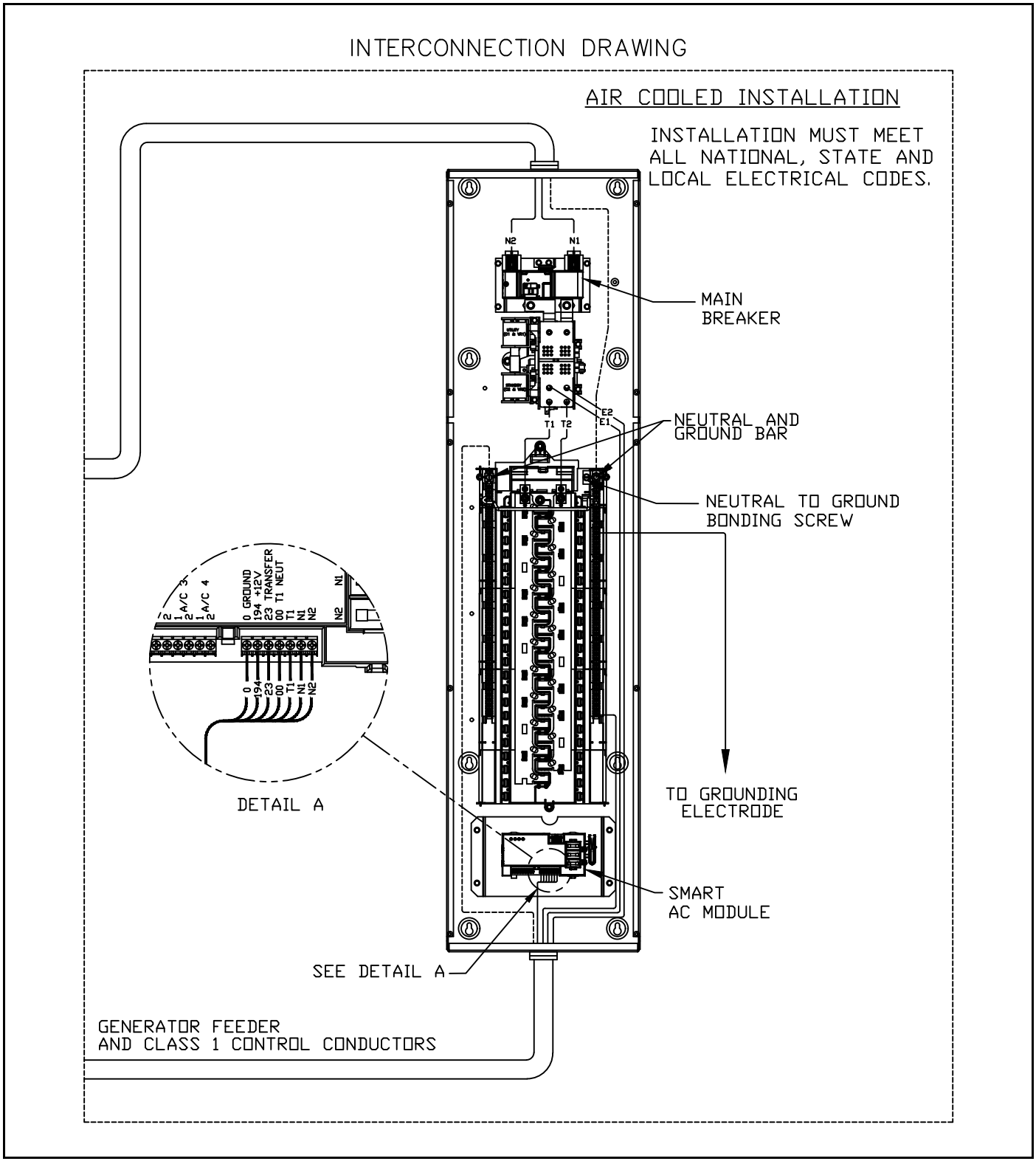
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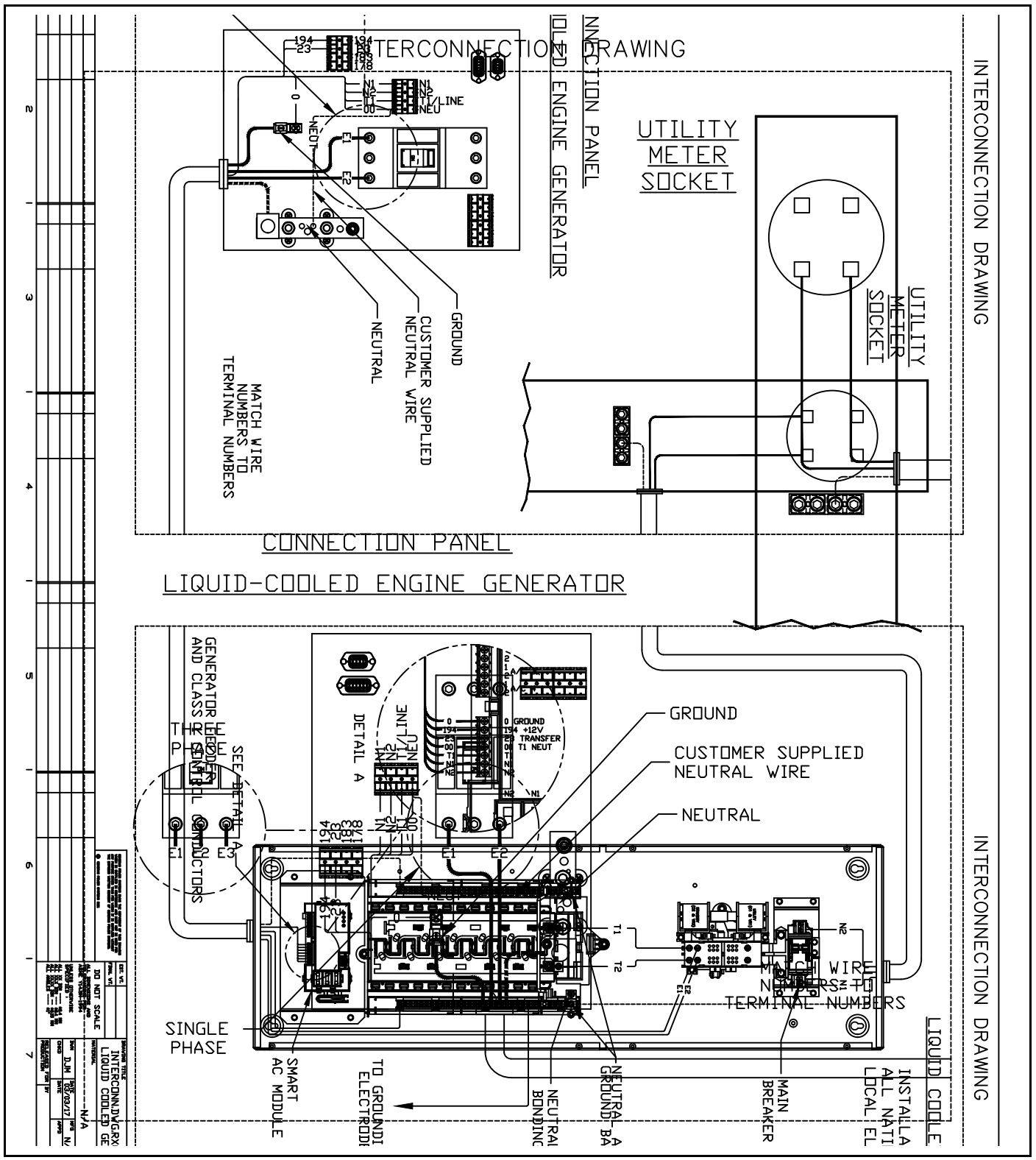
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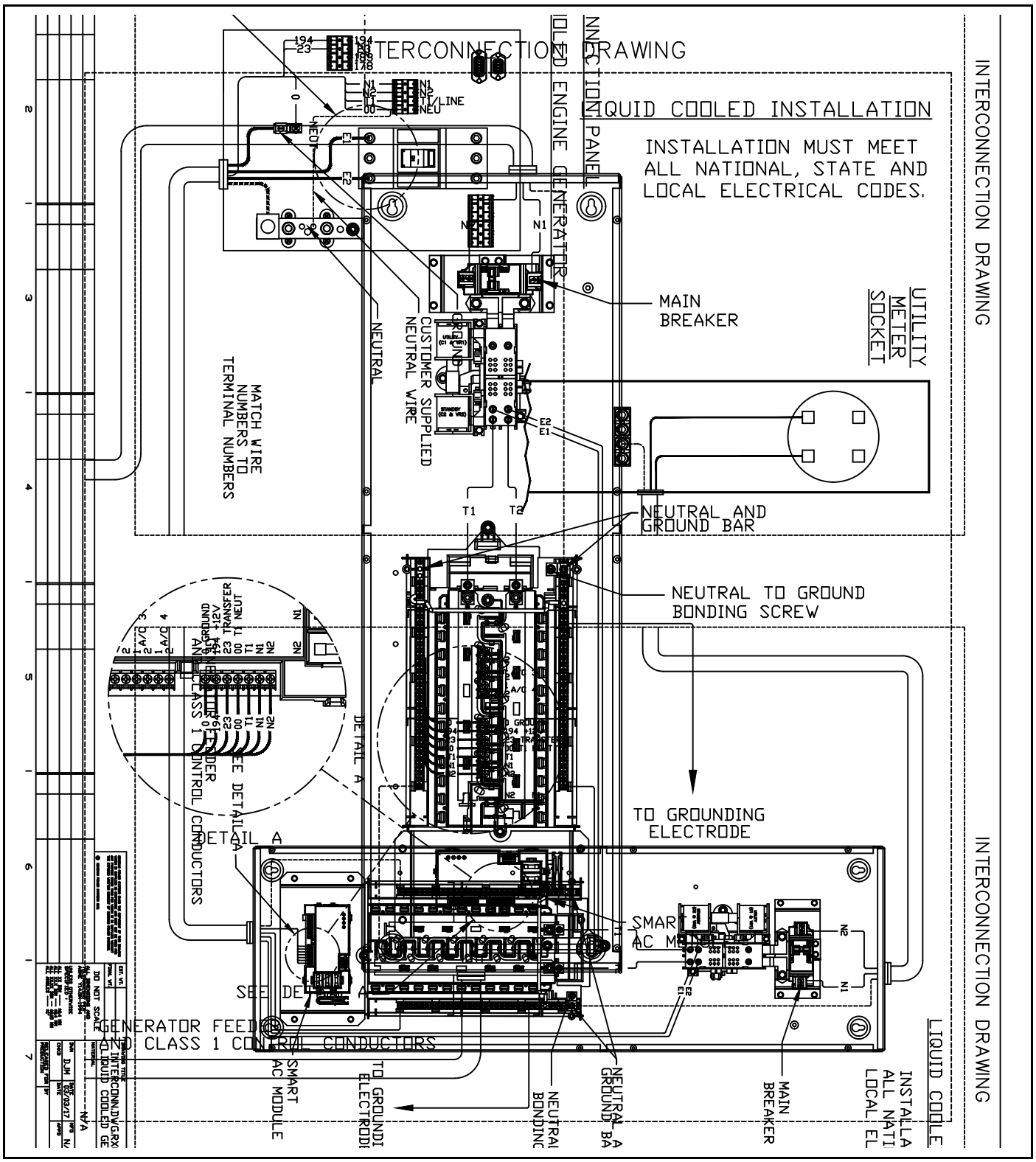
Interconnection Drawings—Liquid-Cooled Generator 100A

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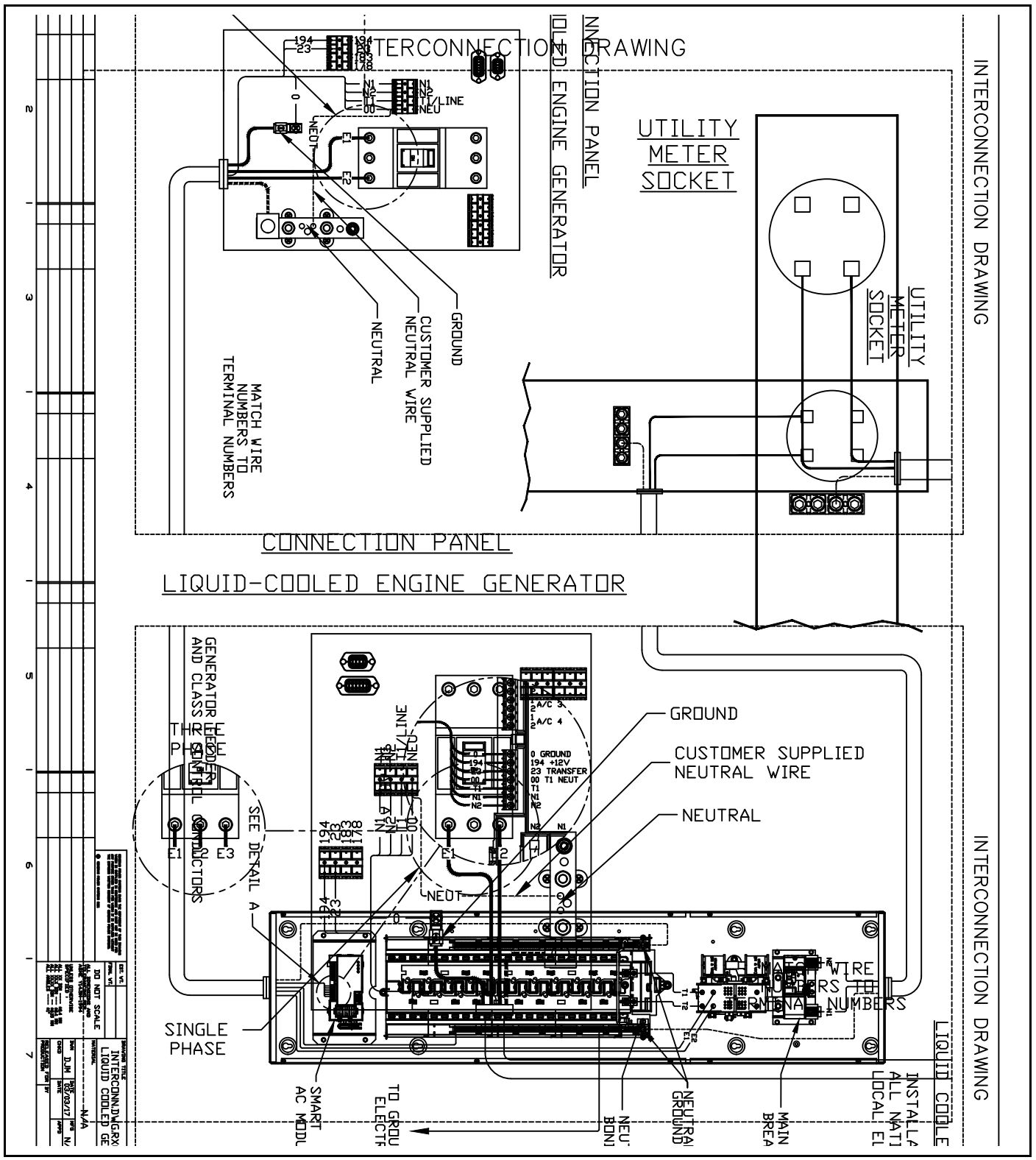
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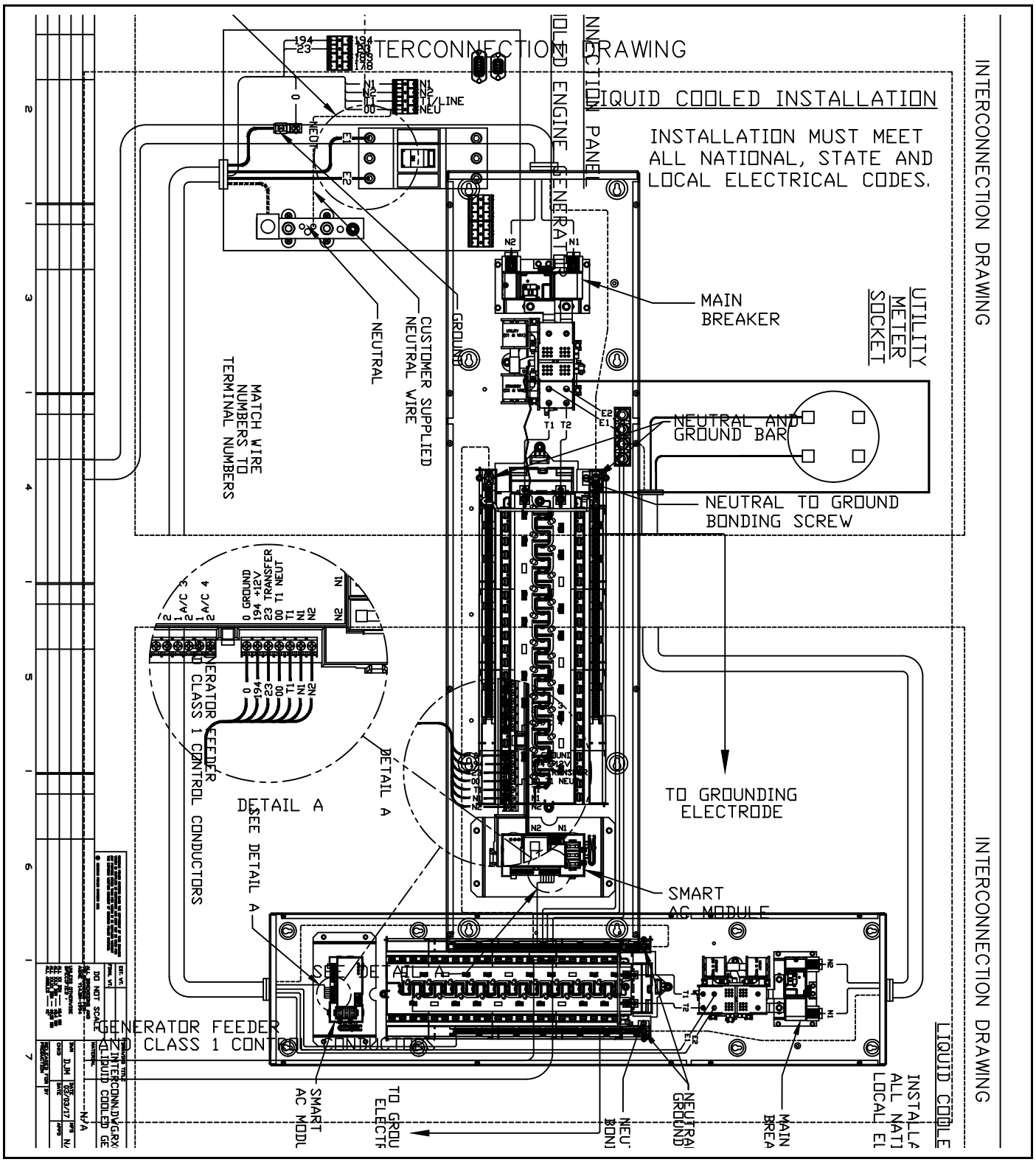
Interconnection Drawings—Liquid-Cooled Generator 200A

No. 10000012707–B (Part 3 of 4)



Interconnection Drawings—Liquid-Cooled Generator 200A

No. 10000012707–B (Part 4 of 4)



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