

O & M Manual for the EGS Metered, Service Entrance Automatic Transfer Switch with Relay Control

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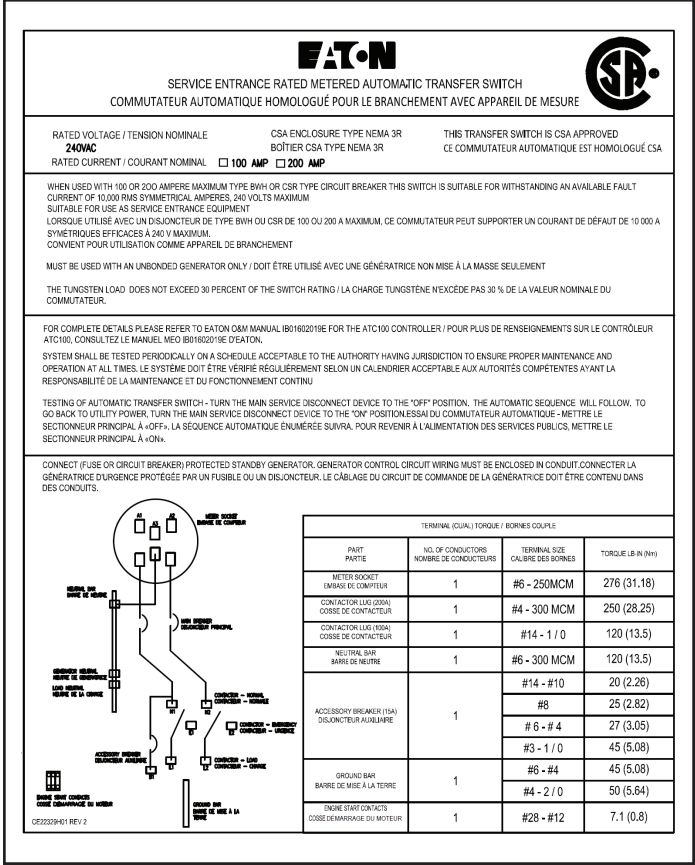


WARNING

READ AND UNDERSTAND THE INSTRUCTIONS CONTAINED HEREINAFTER BEFORE ATTEMPTING TO UNPACK, ASSEMBLE, OPERATE, OR MAINTAIN THIS EQUIPMENT

HAZARDOUS VOLTAGES ARE PRESENT INSIDE TRANSFER SWITCH ENCLOSURES THAT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY. FOLLOW PROPER INSTALLATION, OPERATION, AND MAINTENANCE PROCEDURES TO AVOID THESE VOLTAGES.

THE TRANSFER SWITCH EQUIPMENT COVERED BY THIS INSTRUCTION BOOK IS DESIGNED AND TESTED TO OPERATE WITHIN ITS NAMEPLATE RATINGS. OPERATION OUTSIDE OF THESE RATINGS MAY CAUSE THE EQUIPMENT TO FAIL RESULTING IN DEATH, SERIOUS BODILY INJURY, AND/OR PROPERTY DAMAGE. ALL RESPONSIBLE PERSONNEL SHOULD LOCATE THE DOOR MOUNTED EQUIPMENT RATINGS LABEL AND BE FAMILIAR WITH THE INFORMATION PROVIDED ON THE LABEL. A TYPICAL EQUIPMENT RATINGS LABEL IS SHOWN IN FIGURE 1.



1.2 General Information

ATSs are used to protect critical electrical loads against loss of power. The load's utility power source is backed up by a generator power source. An ATS is connected to both the utility and generator power sources and supplies the load with power from one of these two sources. In the event that power is lost from the utility power source, the ATS transfers the load to the generator power source. Once the utility power is restored, the load is automatically transferred back to the utility power source (Figure 2).

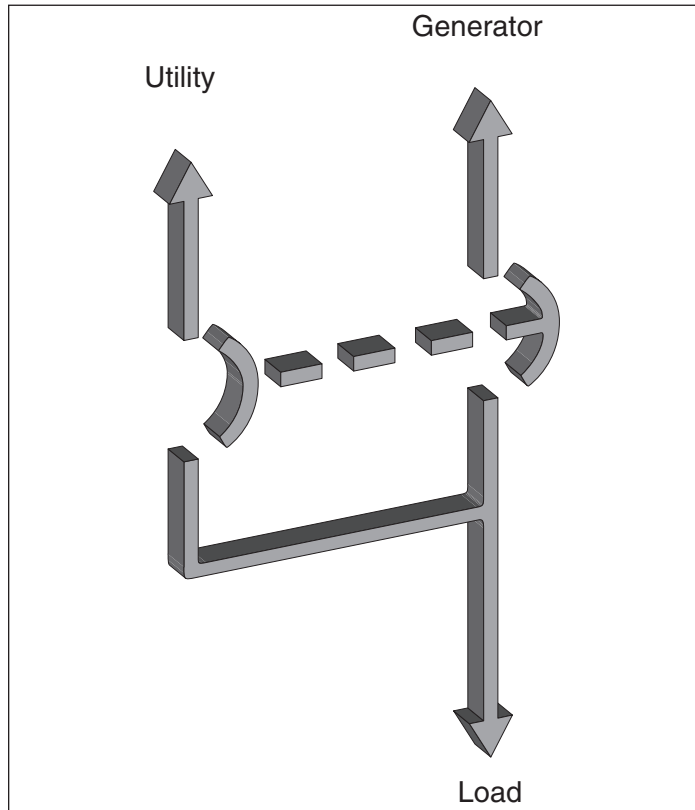


Figure 2. Typical Load Transfer Switch (Contactor) Schematic.

An intelligence system initiates the transfer when the utility power source fails or falls below a preset voltage. An engine start is then initiated by the generator and the ATS transfers to the generator power source when sufficient generator voltage is available. When the utility power source is restored, the ATS automatically transfers back and the generator will shut down after a time delay. In the event the utility power source fails and the generator power source does not appear, the ATS remains connected to the utility power source until the generator power source does appear. Conversely, if connected to the generator power source and the generator power source fails while the utility power source is still unavailable, the ATS remains connected to the generator power source.

ATSs automatically perform the transfer function, and include three basic elements.

1. Main contacts to connect and disconnect the load to and from the source of power.
2. Solenoids to make the transfer of the main contacts from source to source.
3. Intelligence/supervisory circuits to constantly monitor the condition of the power sources and thus provide the intelligence necessary for the switch and related circuit operation.

1.2.1 Design Configuration

The Eaton Metered, Service Entrance Rated, Automatic Transfer Switch is a rugged, compact design that combines a meter socket, service entrance rated disconnect, and ATS all in a single enclosure. The design provides for both top or bottom entry service cabling to the meter socket. A factory wired 100 or 200A circuit breaker provides a Canadian approved service entrance rated disconnect means. The ATS is controlled by an Eaton relay controller and utilizes power contactors to transfer essential loads from one power source to another (see Figure 3). The switch's design uses suitable mechanical and electrical interlock switches to eliminate the possibility of connecting the utility service to the generator output. In addition, a manual override lever is provided for the transfer function.

⚠ WARNING

DO NOT MANUALLY TRANSFER THE SWITCH WHILE UNDER LOAD.

Figure 3. EGSC100AMSE (100 A).



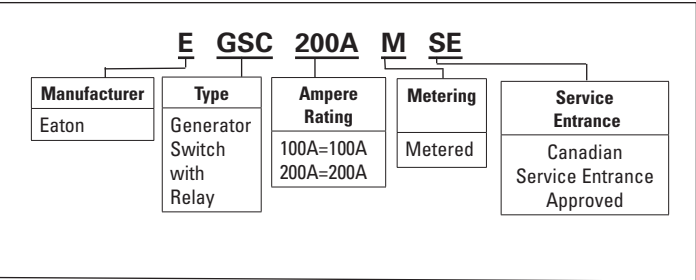
The benefits of the SE configuration are:

- Combined service disconnect and over-current protection in the ATS reduces the overall equipment and installation costs.
- Fewer components and power connections reduce maintenance requirements.

1.3 Transfer Switch Catalogue Number Identification

ATS equipment catalogue numbers provide a significant amount of relevant information pertaining to a specific piece of equipment. The Catalogue Number Identification Table (see Table 1) provides the required interpretation information.

Table 1. ATS Catalogue Numbering System.



1.4 Environmental and Operational Conditions

Normally, an ATS is applied indoors in an electrical equipment room. It can also be used for normal outdoor applications (with standard type 3R enclosure) where the equipment is subject to falling rain, freezing temperatures, and 95% humidity (non-condensing). The ambient temperature range for operation is between -20 and 70°C (-4 and 158°F)..

1.5 Glossary

With respect to their use within this document and as they relate to transfer switch and controller operation, the following terminology is defined.

Available

A source is defined as “available” when it is within its undervoltage setpoint ranges for the nominal voltage setting.

Connected

Connected is defined as when the input is shorted by an external contact or connection.

Failed or Fails

A source is defined as “failed” when it is outside of the applicable voltage setpoint ranges for the nominal voltage and for a time exceeding 0.5 seconds after the time delay emergency fail (TDEF) time delays expires.

Failsafe

Failsafe is a feature that prevents disconnection from the only available power source and also forces a transfer or re-transfer operation to the only available power source.

Re-Transfer

Re-transfer is defined as a change of the load connection from the Generator to the Utility.

Utility

Utility is the primary source (normal source, normal power source, or normal).

Generator

Generator is the secondary source (generator emergency source, emergency power source, emergency, standby, or backup source).

Utility: Failed or Fails

Utility is defined as “failed” when it is outside of its undervoltage setpoint ranges for the nominal voltage and frequency setting.

Generator: Failed or Fails

Generator is defined as “failed” when it is outside of its undervoltage/underfrequency/overfrequency (if applicable) setpoint ranges for the nominal voltage and frequency setting for a time exceeding 0.5 seconds after the Time Delay Emergency Fail (TDEF) time delay expires.

Transfer

Transfer is defined as a change of the load connection from the Utility to the Generator power source.

Unconnected

Unconnected is defined as when the input is not shorted by an external contact or connection.

Section 2: Receiving, Handling, and Storage

2.1 Receiving

Every effort is made to ensure that the ATS equipment arrives at its destination undamaged and ready for installation. The packing is designed to protect the internal components as well as the enclosure. Care should be exercised, however, to protect the equipment from impact at all times. Do not remove the protective packaging until the equipment is at the installation site and ready to be installed.

When the ATS equipment reaches its destination, the customer should inspect the shipping container for any obvious signs of rough handling and/or external damage that occurred during transportation. Record any external and internal damage for reporting to the transportation carrier and to the Eaton sales representative, once a thorough inspection is complete. All claims should be as specific as possible and include the Shop Order and General Order numbers.

A shipping label affixed to the shipping container includes a variety of equipment and customer information, such as General Order and catalogue numbers. Make certain that this information matches the other shipping paper information.

Each ATS enclosure is packaged in its own box. Do not discard the packing material until the equipment is ready for installation.

Once the packaging is removed from the shipment, the enclosure door can be opened. A plastic bag of documents will be found in the enclosure. Important documents, such as wiring diagrams and appropriate instruction leaflets are enclosed within the bag and should be filed in a safe place.

2.2 Handling

As previously mentioned, ATS equipment is packaged in its own box. Protect the equipment from impact at all times and do not double stack. Once the equipment is at the installation site and ready to be installed, the packaging material can be removed. Refer to Section 4 of this manual for specific installation instructions.

2.3 Storage

Although well packaged, this equipment is not suitable for outdoor storage. The equipment warranty will not be applicable if there is evidence of outdoor storage. If the equipment is to be stored indoors for any period of time, it should be stored with its protective packaging material in place. Protect the equipment at all times from excessive moisture, construction dirt, corrosive conditions, and other contaminants. It is strongly suggested that the package-protected equipment be stored in a climate-controlled environment of -20 to 70°C (-4 to 158°F), with a relative humidity of 80% or less. Do not, under any circumstance, stack other equipment on top of an ATS equipment enclosure, whether packaged or not.

Section 3: Equipment Description

3.1 Introduction

The Eaton metered, service entrance rated ATS is assembled and tested at the factory. It is designed to be used in conjunction with standby power distribution equipment to provide an alternate source of power to critical circuits in the event that the primary power source is interrupted.

This ATS monitors both utility and generator power sources and automatically transfers critical load circuits between the two sources, depending on which source is available. The utility power source is preferred and will remain connected to the switch if it is available.

3.2 Meter Socket and Service Disconnect

The meter socket section of the ATS is used for making the primary utility power, and neutral connections. Factory cabling from the load side of the meter jaws carries utility power to the circuit breaker service disconnect and on to the utility lugs of the power contactor assembly. (Figure 6).

3.2.1 Main Contacts

This ATS incorporates a power contactor. The main contacts connect and disconnect the load to and from the different power sources. The power contactor is mechanically and electrically interlocked to prevent the two sets of main contacts from being closed simultaneously.

Figure 4. Typical 100 Ampere Interior Assembly.



3.5 Standards

Eaton ATSs are available to meet NFPA 110 for standby power systems.

Eaton ATS equipment are listed for application by CSA. In addition, Eaton ATSs are listed in the Legacy File LR96245 Master Contract 163545 by Canadian Standards Association under Standard 22.2 #178-1978

Section 4: Installation and Wiring

4.1 General

Eaton ATSs are factory wired and tested. Installation requires solidly mounting the enclosed unit and connecting the power cables and the auxiliary sensing circuits. Physical mounting procedures and power cable connections are covered in this section.

Once a transfer switch is properly installed and wired, it should be mechanically and electrically checked for proper installation and operation. The procedures for these initial mechanical and electrical checks are outlined in Section 5 of this manual.

⚠ WARNING

BE CERTAIN THAT THE DEADFRONT IS PROPERLY INSTALLED BEFORE THE TRANSFER SWITCH EQUIPMENT IS PUT INTO SERVICE. THE DEADFRONT PROVIDES PROTECTION FROM DANGEROUS VOLTAGES AT THE LINE AND LOAD TERMINALS WHEN THE EQUIPMENT IS IN OPERATION. FAILURE TO DO SO COULD RESULT IN PERSONAL INJURY OR DEATH.

4.2 Mounting Location

Choose a location that offers a flat, rigid mounting surface capable of supporting the weight of the enclosed ATS equipment. Protect the transfer switch at all times against excessive moisture, dust, dirt, lint, and corrosive vapours. Check to ensure there are no pipes, wires, or other mounting hazards in the immediate mounting area that could create a problem.

Carefully remove all packing material from the ATS enclosure at the installation site. Even though an equipment inspection was performed when the equipment was received, make another careful inspection of the enclosure and the ATS mechanism as the packing material is removed and the enclosure readied for mounting. Be especially alert for distorted metal, loose wires, or damaged components.

4.3 Overhead / Underground Service Cable Entrance

The Eaton metered, service entrance rated ATS will accommodate either an overhead service cable entrance configuration or an underground one.

Twin 2-½" hub openings on the top of the enclosure will accept a standard Myers type hub. The assembly ships with removable hub closure plates installed over these openings.

For underground service entrance installations the ATS comes equipped with twin wireways. These provide proper protection of the live service cables as they pass through to the utility cable termination point of the enclosure. Bracketing and fasteners located within meter socket section prevent removal of the wireways without first removing the metering section cover. See Figure 6.

In the case of an overhead service entrance installation the wireways may be removed to provide additional working space in the enclosure. Once removed the supplied blanking plates must be installed to cover the access holes into the metering section. In an underground service entrance installation the unused wireway may be removed provided the supplied blanking plate is installed to cover the access hole.

For an underground service installation the wireway being used is removed only to enable the installation of the conduit adapter for the service cable.

NOTE: The wireway must be re-installed prior to feeding the cable through the passage. The wireway can not be installed over cable that has been pre-run through the passage nor can it be removed once the cable has been run through the wireway.

4.3.1 Removing The Underground Service Entrance Wireway

Remove the underground service entrance wireway as follows:

- Remove the enclosure door, dead front and metering section covers;
- Locate and remove the screw and "L" shaped bracket at the top of the wireway that spans the metering section barrier (See Figure 6);
- Locate and remove the screw in the retaining tab built into the back edge of the wireway. The tab is found in the lower section of the enclosure just below the metering section barrier (See Figure 7);
- With the wireway now free to move, slide the wireway upwards into the metering section far enough for the sealing tab on the bottom edge of the wireway to clear the slot it was sitting in (See Figure 8);
- Rotate the bottom end of the wireway inwards towards the center of the enclosure. At the same time begin lifting the bottom end of the wireway away from the back of the enclosure until it will clear the enclosure's bottom edge (See Figure 8). Pull downwards and remove.

Figure 5. Location of wireway "L" retaining brackets.



Retaining
Bracket

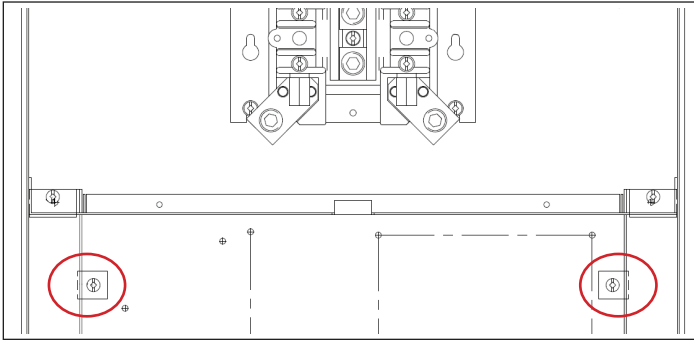
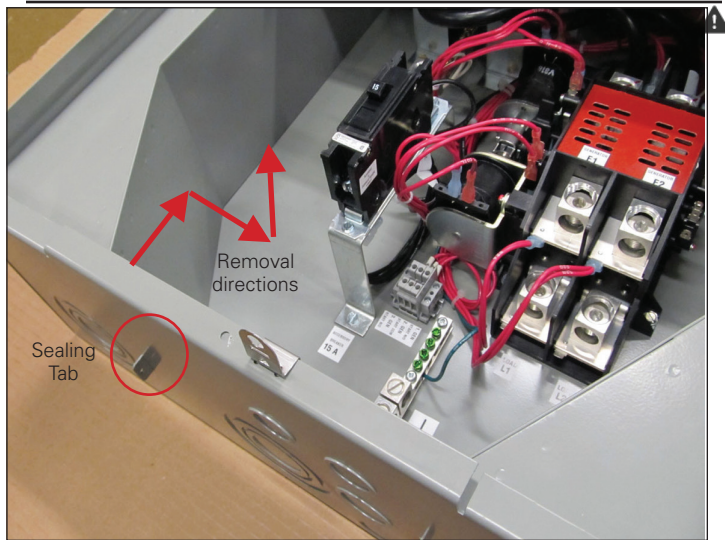


Figure 6. Location of wireway retaining tabs.

Figure 7. Removing the wireway.

4.4 Utility Power Cable Connection



WARNING

POWER CONDUCTORS MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL POWER OR CONTROL CIRCUIT CONDUCTORS TO BE CONNECTED TO THE ATS EQUIPMENT BEFORE BEGINNING TO WORK WITH THE CONDUCTORS AND/OR TERMINATING THEM TO THE EQUIPMENT

CAUTION

TO HELP PREVENT COMPONENT DAMAGE OR FUTURE MALFUNCTIONS, USE EXTREME CARE TO KEEP CONTAMINANTS OUT OF THE ATS EQUIPMENT WHEN MAKING THE POWER CABLE CONNECTIONS.

Test all power cables prior to connection to the unit to ensure that the conductors or cable insulation has not been damaged while being pulled into position.

Power cables are to be connected to solderless, screw type lugs located on the meter socket jaw assembly. Verify that the lugs supplied will accommodate the power cables being used. Also verify that the cables comply with all local electrical codes. Standard ATS equipment, as supplied from the factory, will accommodate the wire sizes shown in Table 2.

Table 2. Wire Sizes for ATSs.

Transfer Switch Amp Rating	Meter Socket Lug Size Range	Number of Cables per Phase
100	#6 AWG - 250 MCM	1
200	#6 AWG - 250 MCM	1

Carefully strip the insulation from the power cables to avoid nicking or ringing of the conductor strands. Prepare the stripped conductor termination end by cleaning it with a wire brush. If aluminum conductors are used, apply an appropriate joint compound to the clean conductor surface area.

CAUTION

IMPROPER POWER CABLE CONNECTIONS CAN CAUSE EXCESSIVE HEAT AND SUBSEQUENT EQUIPMENT FAILURE.

Note: Tighten the cable lugs to the torque identified on the label affixed to the unit's door.

Connect cables as follows (see Figure 9, and Table 2):

- The utility power cables to the utility lugs on the meter socket jaw assembly;
- The utility neutral cable to the utility neutral lug on the meter socket jaw assembly.

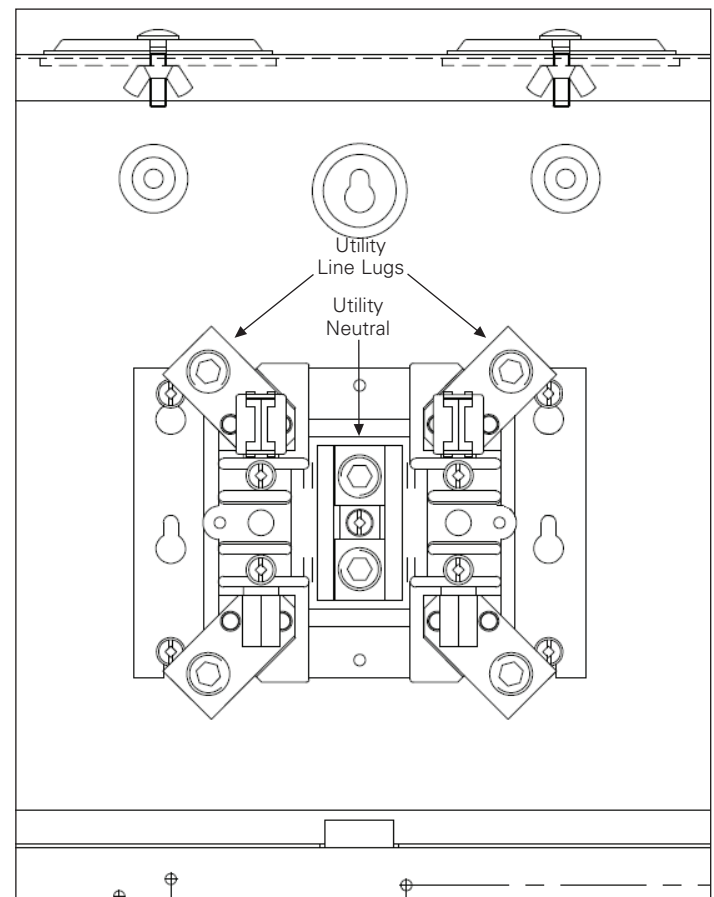


Figure 8. Power and Neutral Utility Cable Connection Locations.

4.5 Generator & Load Power Cable Connection

⚠ WARNING

POWER CONDUCTORS MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL POWER OR CONTROL CIRCUIT CONDUCTORS TO BE CONNECTED TO THE ATS EQUIPMENT BEFORE BEGINNING TO WORK WITH THE CONDUCTORS AND/OR TERMINATING THEM TO THE EQUIPMENT

⚠ CAUTION

TO HELP PREVENT COMPONENT DAMAGE OR FUTURE MALFUNCTIONS, USE EXTREME CARE TO KEEP CONTAMINANTS OUT OF THE ATS EQUIPMENT WHEN MAKING THE POWER CABLE CONNECTIONS.

Test all power cables prior to connection to the unit to ensure that the conductors or cable insulation has not been damaged while being pulled into position.

Power cables are to be connected to solderless, screw type lugs located on the contactor assembly. Verify that the lugs supplied will accommodate the power cables being used. Also verify that the cables comply with all local electrical codes. Standard ATS equipment, as supplied from the factory, will accommodate the wire sizes shown in Table 3.

Table 3. Wire Sizes for ATSs.

Transfer Switch Amp Rating	Contactor Lug Size Range	Number of Cables per Phase
100	#14 - 1/0 AWG	1
200	#4 AWG - 300 MCM	1

⚠ CAUTION

IMPROPER POWER CABLE CONNECTIONS CAN CAUSE EXCESSIVE HEAT AND SUBSEQUENT EQUIPMENT FAILURE.

Note: Tighten the cable lugs to the torque identified on the label affixed to the unit's door.

Connect cables as follows (see Figure 10, and Table 3):

- The generator power cables to the generator lugs on the contactor assembly.
- The load power cables to the load lugs on the contactor assembly.
- The generator neutral cable to the generator neutral lug on the neutral bar assembly.
- The load neutral cable to the load neutral lug on the neutral bar assembly.
- The generator and load ground cable to the generator and load ground lugs on the ground bar assembly.

⚠ WARNING

FAILURE TO PROPERLY CONNECT THIS TRANSFER SWITCH PER NFPA 70, THE NATIONAL ELECTRIC CODE, MAY RESULT IN PRODUCT FAILURE, FIRE, LOSS OF PROPERTY, LOSS OF LIFE, ETC.

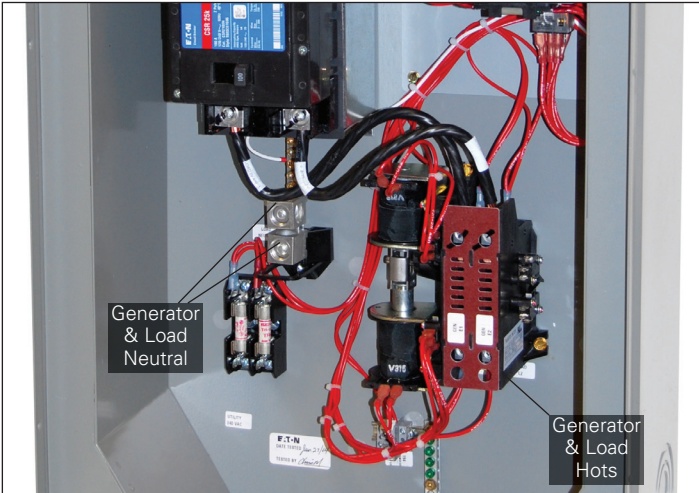


Figure 9. Generator & Load Power Cable Connection Locations.

4.6 Wiring

⚠ WARNING

POWER CONDUCTORS AND CONTROL WIRING MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL POWER OR CONTROL CIRCUIT CONDUCTORS BEFORE BEGINNING TO PERFORM ANY WIRING ACTIVITY TO OR WITHIN THE ATS EQUIPMENT.

⚠ CAUTION

CHECK THE ATS EQUIPMENT NAMEPLATE FOR RATED VOLTAGE. IT SHOULD BE THE SAME AS THE UTILITY AND GENERATOR LINE VOLTAGES. OPERATING THE EQUIPMENT ON IMPROPER VOLTAGE CAN CAUSE EQUIPMENT DAMAGE.

4.7 Installation

In a typical installation (see Figure 11), the generator (2) and utility power connect to the metered ATS (1). Power from the utility or the generator (2) is fed to the main circuit breaker panel from the ATS (1). The circuit breaker in the metered ATS is the service entrance disconnect for the installation.

When the utility power fails, the Generator will sense the failure, the generator will start, and when sufficient generator voltage is available, the ATS will switch. All loads will receive power from the generator. When utility power returns, the ATS will switch all power back to the utility source and the generator will shut down after its defined cooled down period.

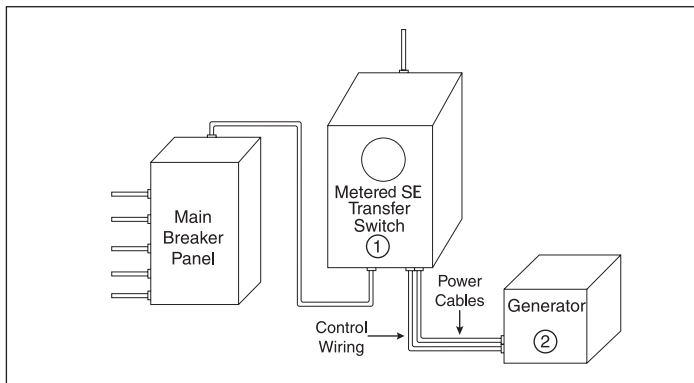


Figure 10. Typical Installation of a Residential ATS.

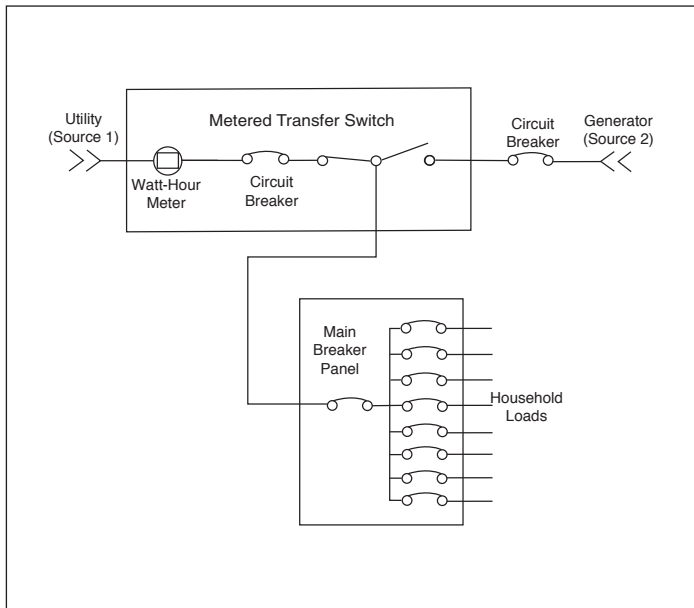


Figure 11. One Line Diagram of a Typical Installation.

4.7 Generator Transfer Connection

The generator transfer contact connection terminal blocks are located beside the contactor near the side of the enclosure.

Note: Prior to making the generator transfer connection to the ATS, set the generator control selector switch to the OFF position to prevent an unwanted generator start. Control wiring, such as the generator transfer wires and utility sensing, must be run in a separate conduit from the power cables.

Use the proper wire size as listed by the generator set (Genset) manufacturer.

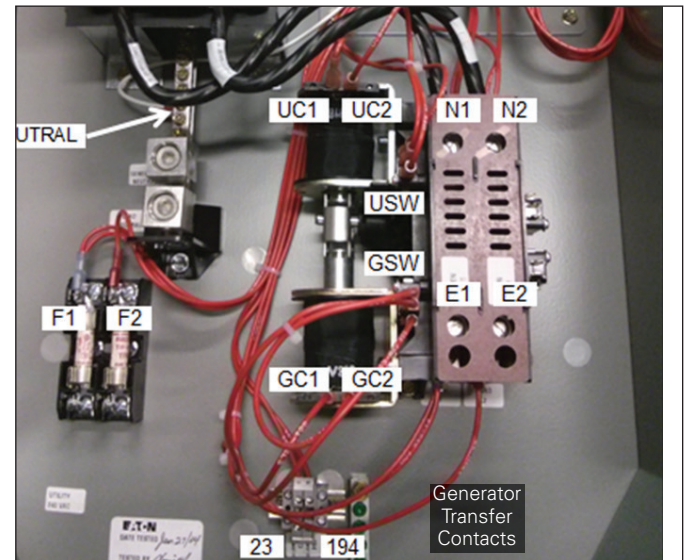


Figure 12. Connection of the Generator Transfer Signal (23, 194).

4.8 Preliminary Checks

After the ATS enclosure is installed and power cables are connected to the equipment, thoroughly inspect the unit to ensure that no tools were left inside and that the cabinet is free of debris. If necessary, use a vacuum cleaner to remove any and all construction or installation debris from the equipment.

Read and understand all labels on the equipment. Review and understand the wiring diagrams supplied with the equipment. Note any optional accessories that may have been furnished with this unit and review their operation.

Verify that the phase-to-phase line voltages of both the utility and generator power sources are the same and that they match the rated voltage as indicated on the ATS ratings label.

CAUTION

SEVERE EQUIPMENT DAMAGE CAN RESULT IF THE UNIT IS NOT APPLIED AT PROPER VOLTAGE. DO NOT ENERGIZE THE EQUIPMENT IF THE SUPPLY VOLTAGES DO NOT MATCH EQUIPMENT RATINGS LABEL.

4.9 Protection

For Catalogue #EGSC100AMSE and EGSC200AMSE

This switch is equipped with integral over-current protection. Continuous load current not to exceed 80 percent of switch rating.

This Transfer Switch is rated for use on a circuit capable of delivering not more than 10,000 rms symmetrical amperes, 240 volts maximum.

Section 5: Functional Testing

WARNING

YOU ARE READY TO ENERGIZE THE EQUIPMENT. VOLTAGES WITHIN THE ENCLOSURE ARE CAPABLE OF CAUSING SEVERE PERSONAL INJURY OR DEATH. USE EXTREME CAUTION TO AVOID CONTACT WITH ENERGIZED EQUIPMENT.

5.1 Preliminary Checks

Step 1: Check all loads connected to the ATS to ensure that they are ready to be energized.

5.2 Energize the Switch

- Step 1: With the service entrance barrier removed use a voltmeter to measure the line-to-line and the line-to-neutral voltages on the line side of the circuit breaker. Confirm the utility voltage is correct then replace the service entrance barrier.
- Step 2: Ensure the generator control selector switch located on the standby generator is set to the OFF position. If so equipped, remove the control fuse from the generator control panel to ensure the generator does not initiate a start during this phase of the preliminary check. Open the generator power source circuit breaker located on the generator assembly.
- Step 3: Close the service entrance disconnect circuit breaker in the switch to connect the ATS to the utility power source voltage. If the ATS unit is not already in the UTILITY position, and the voltage is acceptable, the solenoid will engage and the contactor will automatically switch to the UTILITY position.

WARNING

CONTACT WITH ENERGIZED COMPONENTS WILL CAUSE ELECTRICAL SHOCK CAPABLE OF PRODUCING SEVERE PERSONAL INJURY OR DEATH. USE EXTREME CAUTION TO AVOID CONTACT WITH ENERGIZED COMPONENTS WHEN USING A METER FOR VOLTAGE CHECKS.

- Step 4: Replace the control fuse in the generator control panel removed in Step 2 of Section 5.2. Position the generator control selector switch, located on the standby generator, to the AUTOSTART position. (It may also be labeled REMOTE START or AUTO.). Close the generator power source circuit breaker opened in Step 2 of Section 5.2.

5.3 Operational Checks

- Step 1: Open the service entrance disconnect circuit breaker originally closed in Step 3 of Section 5.2.

NOTICE

THIS WILL SIMULATE AN INTERRUPTION OF THE UTILITY POWER SOURCE.

- Step 2: After a time delay (based on the generator settings), the standby generator engine will start.
- Step 3: Using a voltmeter, measure the line-to-line and line-to-neutral voltages across the generator line terminals to ensure that the generator emergency voltage is correct. If necessary, make adjustments to the voltage regulator on the generator according to the manufacturer's recommendations to correct any voltage deviations. The ATS will only respond to the correct voltage from the generator power source.
- Step 4: The ATS Time Delay Normal (Utility) to Emergency (Generator) (TDNE) will begin to time after the generator engine begins to run. After time out, the solenoid will engage and the contactor will automatically switch from the UTILITY to the GENERATOR position.
- Step 5: Close the service entrance disconnect circuit breaker described in Step 3 of Section 5.2.
- Step 7: The ATS Time Delay Emergency (Generator) to Normal (Utility) (TDEN) timer will begin timing, and the solenoid will engage and automatically switch from the GENERATOR to the UTILITY position and the generator will shut down after a cool down period.

5.4 Manual Operation

⚠ WARNING

DO NOT ATTEMPT TO MANUALLY OPERATE THE ATS WITH THE UTILITY OR GENERATOR AVAILABLE.

⚠ WARNING

HIGH VOLTAGES ARE PRESENT IN AND AROUND TRANSFER SWITCH EQUIPMENT. BEFORE ATTEMPTING TO MANUALLY TRANSFER, DISCONNECT THE LINE POWER FROM THE EQUIPMENT BEING SERVICED BY OPENING AND LOCKING OUT, IF POSSIBLE, THE NEXT HIGHEST DISCONNECT DEVICE. FAILURE TO FOLLOW THIS PROCEDURE COULD CAUSE SEVERE PERSONAL INJURY AND/OR DEATH.

ALWAYS TURN THE UTILITY POWER OFF AND TURN THE GENERATOR (IF A GENERATOR) CONTROL SELECTOR SWITCH TO THE "OFF" POSITION BEFORE ATTEMPTING A MANUAL TRANSFER.

⚠ WARNING

INSURE THE DEADFRONT IS INSTALLED PRIOR TO ENERGIZING THE TRANSFER SWITCH.

To Manually Operate

- Step 1: Disconnect all sources of power.
- Step 2: Locate the manual lever between the solenoids..
- Step 3: Locate the handle used to manually transfer the switch.
- Step 4: Attach the handle to the manual lever.
- Step 5: Move the lever up to go to utility or move the lever down to go to generator.
- Step 6: Reconnect the power.

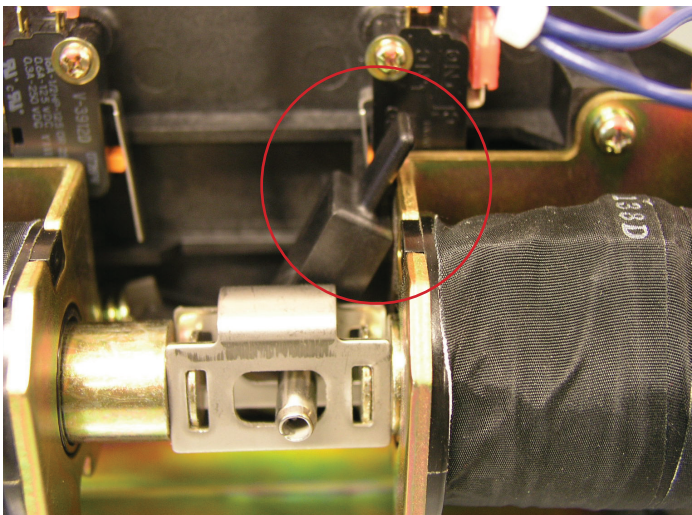


Figure 13. ATS Manual Operating Lever.

Figure 14. ATS Manual Operating Handle.



Section 7: Maintenance and Component Replacement

7.1 Introduction

WARNING

HIGH VOLTAGES ARE PRESENT IN AND AROUND TRANSFER SWITCH EQUIPMENT. BEFORE INSPECTING OR MAINTAINING THIS EQUIPMENT, DISCONNECT THE LINE POWER FROM THE EQUIPMENT BEING SERVICED BY OPENING AND LOCKING OUT, IF POSSIBLE, THE NEXT HIGHEST DISCONNECT DEVICE. FAILURE TO FOLLOW THIS PROCEDURE COULD CAUSE SEVERE PERSONAL INJURY AND/OR DEATH.

In general, ATS equipment is designed to be relatively maintenance free under normal usage. However, because of the variability of application conditions and the importance placed on dependable operation by this type of equipment, inspection and maintenance checks should be made on a regularly scheduled basis. Since equipment maintenance will consist mainly of keeping the equipment clean, the frequency of maintenance will depend, to a large extent, on the cleanliness of its surroundings. If a significant amount of dust or foreign matter is present, a more frequent maintenance schedule should be followed.

It is suggested that visual inspections of the equipment be made on a regular basis, not just during regularly scheduled periods. Always be alert for an accumulation of dirt in and around the structure, loose parts and/or hardware, cracks and/or discoloration to insulation, and damaged or discolored components.

Figure 16 is the wiring diagram for the EGS ATS switch.

Note: Only qualified and experienced personnel should attempt any diagnostic work using this diagram.

7.2 Procedures

A suggested maintenance procedure to be followed is outlined in Table 4.

Table 4. Recommended Periodic Maintenance Procedures

Step	Action
a. Make the transfer switch equipment safe for inspection and/or maintenance.	Disconnect the line power from the equipment being serviced by opening next highest disconnect device. Make certain that any accessory control power is switched off.
b. Inspect the structure area for safety hazards or potential maintenance problems.	Inspect the area, especially where the contactor is installed, for any safety hazards, including personal safety and fire hazards. Exposure to certain chemical vapors can cause deterioration of the electrical connections. Inspect for accumulated dirt, loose hardware, or physical damage. Examine the primary insulation for evidence of cracking or overheating. Overheating will show as discoloration, melting, or blistering of the conductor insulation, or as pitting or melting of the conductor surfaces due to arcing. Inspect the secondary control connections for damage, and control wiring for insulation integrity.
c. Inspect the contactor for dust, dirt, soot, grease, moisture, or corrosion.	Remove dust, dirt, soot, grease, moisture, and corrosion contamination from the surface of the switching device using a dry, soft lint-free cloth, dry soft bristle brush, and vacuum cleaner. Do not blow debris into the contactor. If contamination is found, look for the source and fix the problem.
d. Check for material integrity, uneven wear, discoloration, or loose hardware.	Severe material cracking will require replacement and loose hardware will need to be tightened.
e. Check the terminals and connectors for looseness or signs of overheating.	Overheating will show as discoloration, melting, or blistering of the conductor insulation. Connections that do not have signs of looseness or overheating should not be disturbed.
f. Exercise the contactor if it is not often exercised while in operation. This will permit the wiping action by the contacts.	If a switching device is used for frequent switching during normal operation, this step can be disregarded.
g. Return the transfer switch equipment to service.	Make certain all barriers are in place and the door is closed. Re-apply generator and utility power.

IND1 - UTILITY AVAILABLE
IND2 - UTILITY CONNECTED
IND3 - GENERATOR AVAILABLE
IND4 - GENERATOR CONNECTED

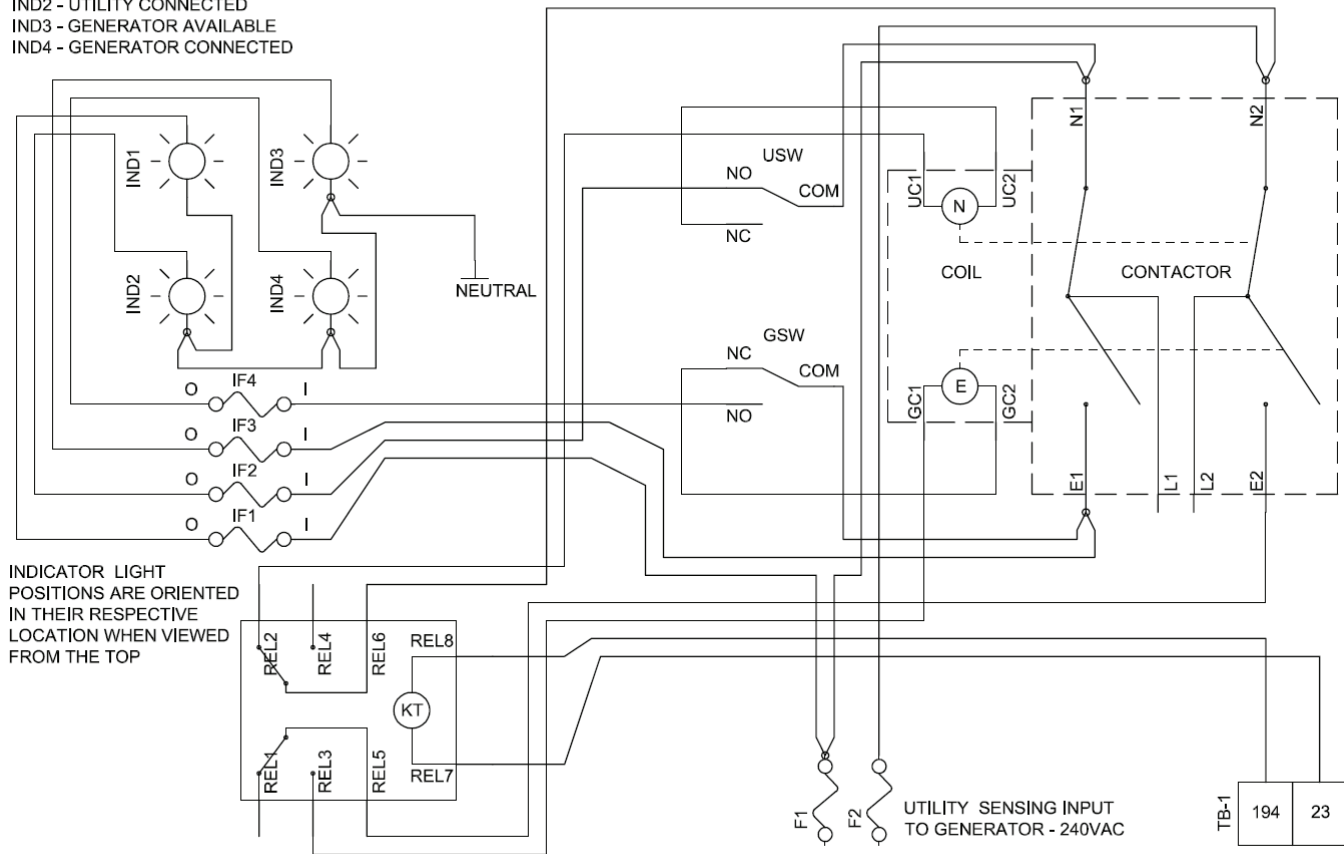


Figure 15. Wiring Diagram for the EGSC ATS (Shown Connected to Utility).

[illegible]

7.4 Component Replacement

Certain components within the ATS are field replaceable. Table 5 lists the part numbers to use when ordering replacement components. To order replacement components, contact an authorized Eaton Sales Representative.

Table 5. Field Replaceable Components.

Component	Part Number	ATS Model
Contactors	99-5638	100A
Contactors	99-5702	200A
Harness EGS	CE22363H01	100/200 A
Service Entrance Breaker	CSR2100 & MCBK225	100A
Service Entrance Breaker	CSR2200 & MCBK225	200A
Locking Hasp	99-2512-5	100/200A

WARNING

HIGH VOLTAGES ARE PRESENT IN AND AROUND TRANSFER SWITCH EQUIPMENT. BEFORE ATTEMPTING TO REPLACE ANY COMPONENT, DISCONNECT THE LINE POWER FROM THE EQUIPMENT BEING SERVICED BY OPENING AND LOCKING OUT, IF POSSIBLE, THE NEXT HIGHEST DISCONNECT DEVICE. FAILURE TO FOLLOW THIS PROCEDURE COULD CAUSE SEVERE PERSONAL INJURY AND/OR DEATH.

ALWAYS TURN THE UTILITY (SOURCE 1) POWER OFF AND TURN THE GENERATOR (SOURCE 2) CONTROL SELECTOR SWITCH TO THE "OFF" POSITION BEFORE ATTEMPTING TO REPLACE ANY COMPONENTS.

NOTICE

APPLY UTILITY (SOURCE 1) POWER AND PLACE THE GENERATOR CONTROL SELECTOR SWITCH IN THE "AUTO" POSITION AFTER THE COMPONENT HAS BEEN REPLACED. TEST THE SYSTEM FOR PROPER FUNCTIONALITY.

7.5 Troubleshooting

Table 6 contains troubleshooting information for the EGS ATS. If a problem still exists after completing the troubleshooting procedures, contact an authorized Eaton sales representative.

Table 6. Troubleshooting Chart.

Problem	Cause	Correction
The automatic transfer switch does not transfer to the generator.	1 The generator breaker is open. 2. The generator voltage is not acceptable.	1. Reset the generator circuit breaker. 2. Refer to the generator User's Manual
The automatic transfer switch does not transfer to the utility.	1. The service disconnect breaker is open. 2. The utility voltage is not acceptable.	1. Reset the service disconnect breaker. 2. Wait for the utility voltage to return to normal
The generator is still running after the transfer switch transfers to the utility.	Engine cool down period.	The engine should stop after the cool down.

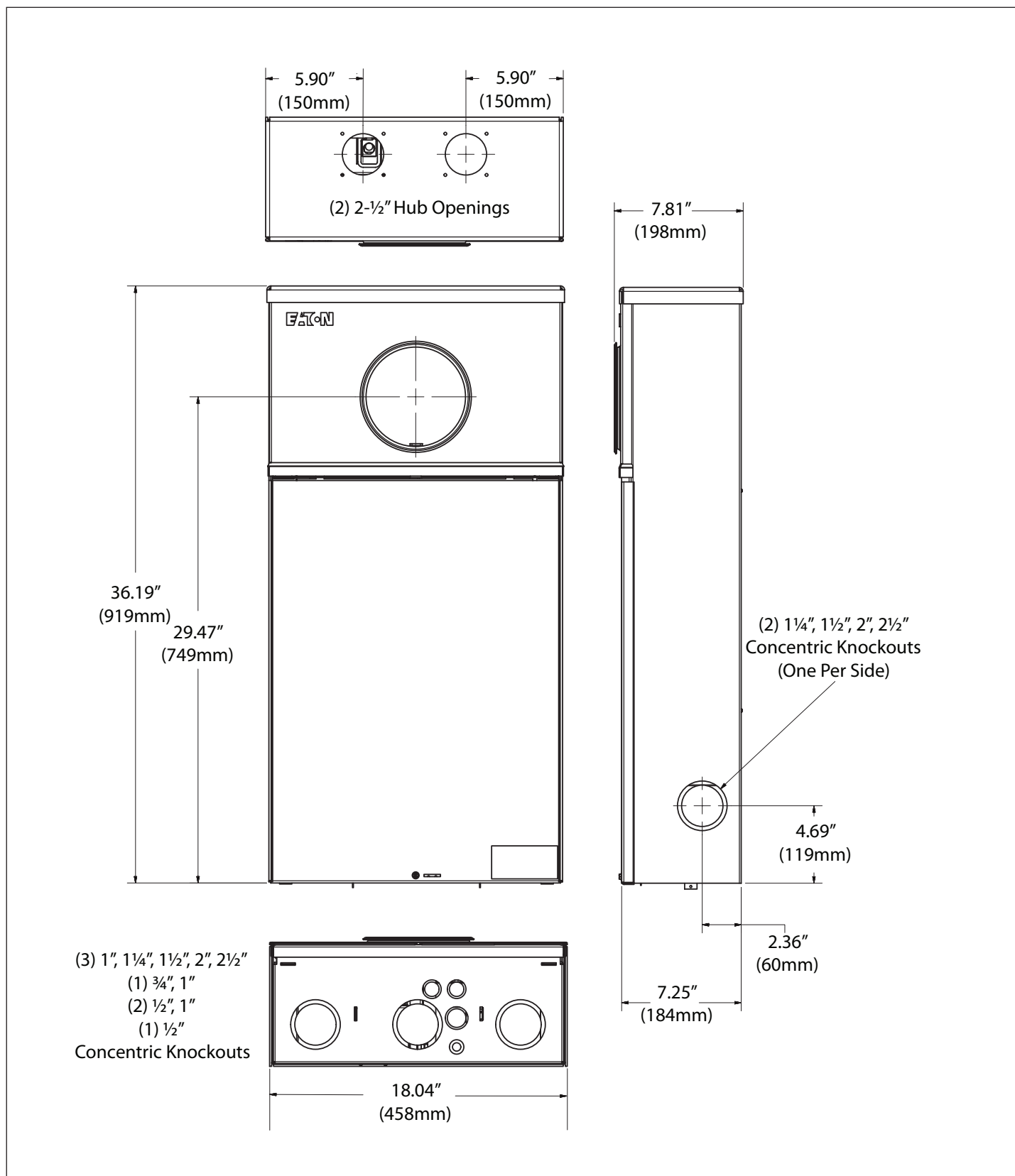


Figure 16. Dimensions and Plan View of a Service Entrance EGS (in.) (200A).

Notes:

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