O & M Manual for 100-1600A
ATC-300+ /900 Contactor Open/Closed Transition
Fixed/Dual Drawout Bypass Isolation Transfer Switch
Instruction Booklet (412)

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WARNING

READ AND UNDERSTAND THE INSTRUCTIONS CONTAINED HEREIN-AFTER BEFORE ATTEMPTING TO UNPACK, ASSEMBLE, OPERATE, OR MAINTAIN THIS EQUIPMENT.

WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E, OSHA AND OTHER APPLICABLE REQUIREMENTS PERTAINING TO OPERATOR SAFETY PRIOR TO SERVICING EQUIPMENT. ALL WORK ASSOCIATED WITH SUCH ELECTRICAL EQUIPMENT SHOULD BE PERFORMED ONLY BY A QUALIFIED/COMPETENT PERSON AS DEFINED BY APPLICABLE REGULATION WHO SHOULD ALSO FOLLOW ALL APPLICABLE PROTECTIVE CLOTHING SYSTEM REQUIREMENTS AND REVIEW APPROPRIATE HAZARD ASSESSMENT AND ENERGY CONTROL PRECAUTIONS AND PROCEDURES. FAILURE TO FOLLOW THIS WARNING COULD LEAD TO DEATH OR SEVERE INJURY.

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 NAMEPLATE AND BE FAMILIAR WITH THE INFORMATION PROVIDED ON THE NAMEPLATE. A TYPICAL EQUIPMENT NAMEPLATE IS SHOWN IN FIGURE 1.

NOTICE

A FINAL INSPECTION OF THE EQUIPMENT SHOULD BE PERFORMED PRIOR TO ENERGIZING THE TRANSFER SWITCH.

Step 1: Remove any dirt or debris that may have collected during shipment or installation. NEVER use high pressure blowing air. This could drive dirt or other foreign objects into electrical or mechanical components which could cause damage. Use an industrial quality vacuum cleaner to remove any dirt or foreign objects.

Step 2: Be certain all cable connections are correct and that the phase rotation of both sources match.

Step 3: Inspect the engine start connections and verify the correct connection of all control wires.

Step 4: Check all programmable setpoints and adjust as necessary. In addition, adjust any optional accessories as required.

Step 5: Be certain that the actual lug torque values are in keeping with the requirements outlined in this instruction book to insure the integrity of power connections.

Step 6: Check to be sure that all covers and barriers are properly installed and fastened.

ALL POSSIBLE CONTINGENCIES WHICH MAY ARISE DURING INSTALLATION, OPERATION, OR MAINTENANCE, AND ALL DETAILS AND VARIATIONS OF THIS EQUIPMENT DO NOT PURPORT TO BE COVERED BY THESE INSTRUCTIONS. IF FURTHER INFORMATION IS DESIRED BY THE PURCHASER REGARDING HIS PARTICULAR INSTALLATION, OPERATION, OR MAINTENANCE OF PARTICULAR EQUIPMENT, CONTACT AN EATON REPRESENTATIVE.

Figure 1. Typical Automatic Transfer Switch Equipment Nameplate.
Section 1: Introduction

1.1 Preliminary Comments and Safety Precautions

This technical document is intended to cover most aspects associated with the installation, application, operation, and maintenance of ATC-300+/900 controlled contactor based transfer switch equipment with ratings from 100 through 1600 amperes (A). It is provided as a guide for authorized and qualified personnel only. Please refer to the specific WARNING and CAUTION in Section 1.1.2 before proceeding. If further information is required by the purchaser regarding a particular installation, application, or maintenance activity, contact an Eaton representative. For information associated with the control, refer to the separate instruction book pertaining to the logic package installed in the switch.

1.1.1 Warranty and Liability Information

No warranties, expressed or implied, including warranties of fitness for a particular purpose of merchant-ability, or warranties arising from course of dealing or usage of trade, are made regarding the information, recommendations and descriptions contained herein. In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information and descriptions contained herein.

1.1.2 Safety Precautions

All safety codes, safety standards, and/or regulations must be strictly observed in the installation, operation, and maintenance of this device.

WARNING
THE WARNINGS AND CAUTIONS INCLUDED AS PART OF THE PROCEDURAL STEPS IN THIS DOCUMENT ARE FOR PERSONNEL SAFETY AND PROTECTION OF EQUIPMENT FROM DAMAGE. AN EXAMPLE OF A TYPICAL WARNING LABEL HEADING IS SHOWN ABOVE TO FAMILIARIZE PERSONNEL WITH THE STYLE OF PRESENTATION. THIS WILL HELP TO INSURE THAT PERSONNEL ARE ALERT TO WARNINGS, WHICH APPEAR THROUGHOUT THE DOCUMENT. IN ADDITION, CAUTIONS ARE ALL UPPER CASE AND BOLDFACE.

CAUTION
DO NOT ATTEMPT TO SERVICE OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. FAILURE TO FOLLOW THIS WARNING COULD LEAD TO DEATH OR SEVERE INJURY. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON EQUIPMENT PRIOR TO SERVICING. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO OPERATING, INSPECTING OR SERVICING EQUIPMENT.

Figure 2. Typical Load Transfer Switch (Switching Device Type) Schematic. One Three Position, Closed on Source 1, Contactor Shown.
1.2.1 Transfer Switch Types

Open/closed transition bypass isolation type automatic transfer switches consist of four basic elements.

1. Main contacts to connect and disconnect the load to and from the source of power.
2. 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.
3. A transfer mechanism to effect the transfer of the main contacts from source to source.
4. Voltage selection, bypass selection, and transformer panel.

The Fixed Bypass Isolation Switch shown in Figure 3 is designed for applications where maintenance, inspection, and testing must be performed while maintaining continuous power to the load. This is typically required in critical life support systems and standby power situations calling for safe system maintenance with no power disruptions. Such a design allows for the quick removal of the ATS switching devices for inspection, maintenance, or replacement.

1.2.2 Design Configuration

The Eaton transfer switch is a rugged, compact design utilizing power contactors to transfer essential loads from one power source to another. Open transition switching devices are interlocked to prevent both switching devices from being closed at the same time.

The switching devices are in a compact vertical arrangement. The logic can be easily disconnected from the switching device without disturbing critical connections. The enclosure is free standing, and is seismic approved. The terminals are mounted in the rear of the switch for front access, permitting rear, top, bottom, or side cable entrance. The terminals also can be mounted on the top or bottom or any assortment of that.

The switching devices have a high withstand rating (Table 1). Figure 4 shows the schematic of the Bypass Isolation Switch. There are two contactors that enable the transfer as a bypass in an open or closed transition. The unit can also be operated as a redundant switch with the controller being full activated with the primary (ATS) or redundant (Bypass) switch.

There is not a need to move the Bypass contactor to the ATS slot if the ATS contactor is removed for a dual redundant switch to operate. The Bypass (top) will be an automatic switch although only as an open ATS not a closed ATS.

Figure 3. Typical Fixed Bypass Isolation Switch. The 1600 Amp Bypass Contactor (top) is always a draw-out type. The 1200 Amp and below are either Fixed or Draw-out Types.
Figure 4. Typical Bypass Dual Drawout Isolation Switch Schematic.

Table 1. 1600 Amp Frame Bypass Withstand Ratings.

<table>
<thead>
<tr>
<th>UL 1008 WITHSTAND AND CLOSE-ON RATINGS (KA)</th>
<th>480 VOLTS</th>
<th>480 VOLTS</th>
<th>600 VOLTS</th>
<th>600 VOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Breaker</td>
<td>Specific Breaker</td>
<td>Any Breaker</td>
<td>Specific Breaker</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>200</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>18</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>320</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>400</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>600</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>800</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>1000</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>1200</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
<tr>
<td>1600</td>
<td>50,000</td>
<td>65,000</td>
<td>42,000</td>
<td>65,000</td>
</tr>
</tbody>
</table>

Tested in accordance with UL 1008.
Eaton transfer switch will coordinate with a power switching device short time rating. Contact factory for details.

When protected by Fuses at test voltage of 600V (1600 consult factory)
- Fuse Rating: 200kA
- Fuse Types: L,R,J,T
- Max. Fuse Amps: 1600A

Table 1 shows the 1600 amp bypass which is rated to 100 amps.
Table 1a shows the ratings for a 400 Amp frame that is physically smaller with lower ratings. The Instruction Booklet for the 400 frame size is IB01602071E.

Table 1a. 400 Amp Frame Bypass Withstand Ratings.

<table>
<thead>
<tr>
<th>UL 1008 WITHSTAND AND CLOSE-ON RATINGS (KA)</th>
<th>480 VOLTS</th>
<th>480 VOLTS</th>
<th>600 VOLTS</th>
<th>600 VOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Breaker</td>
<td>Specific Breaker</td>
<td>Any Breaker</td>
<td>Specific Breaker</td>
<td></td>
</tr>
<tr>
<td>400 and below</td>
<td>30,000</td>
<td>50,000</td>
<td>22,000</td>
<td>35,000</td>
</tr>
<tr>
<td>200 and below</td>
<td>22,000</td>
<td>35,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At a Test Voltage of 240V the Any Breaker is 35kA
Fuse test at 600V 220kA
Tested in accordance with UL 1008.
Eaton transfer switch will coordinate with a power switching device short time rating. Contact factory for details.
1.3 Draw-out Switching Device

All switching devices are 100% rated, Underwriters Laboratories (UL) 1008 listed, and are built and tested in an ISO 9002 certified facility to applicable NEMA, ANSI, IEEE, and UL standards. The main difference between the ATS and the Bypass versions of the switching devices (contactors) used in the bypass isolation transfer switch is that the Bypass contactor is fixed with no truck enabling it to be drawn out. With the Dual Drawout version, both contactors can be removed as they both have trucks (BP is only removed with power off). Figure 5 shows the two contactors in the switch. The bottom is the ATS contactor and the top is the bypass contactor. The ATS contactor will do nearly all of the current transfer for the loads during the life of the switch. The ATS switching device is mounted with safety interlocks, in a "truck" mechanism, allowing the switching device to be “drawn-out” for service, maintenance, and/or replacement. The Bypass device is a fixed type contactor or a drawout type.

1.3.1 Draw-out Switching Devices

The drawout process for the contactor has three positions, Locked In, Isolated, Removed. When the unit is being drawn out it goes from Locked In to Isolated. In the Isolated position the contactor is off the stabs with the secondary connector still connected. This allows for contactor to be operated for test with the door open or closed. To proceed from Isolated to Removed the door should be opened. Figure 6 shows the contactor fully disconnected from the transfer switch. In this case, the primary and secondary connectors are disconnected. It is ready for removal. The ATS draw-out switching device is equipped with both primary and secondary disconnects to provide for the draw-out functioning. The primary contacts (Figure 7) are the S1, S2, and load contacts. The secondary contacts are the control and feedback contacts. The secondary connector is on the side of the truck (top left of truck for the 1600 amp) and is somewhat floating for easy racking-in. The operating mechanism is electrically operated and also has a mechanical operation if required in an emergency. When withdrawn, the ATS switching device can be inspected, tested, and minor maintenance performed. The inside of the compartment can also be inspected with the ATS switching device withdrawn. Caution must be taken as there is voltage on the run-backs (copper) in the back of the cell once the contactor is removed.

**WARNING**
DO NOT ATTEMPT TO PERFORM MAINTENANCE OR SERVICE EQUIPMENT WHILE IT IS ENERGIZED. FAILURE TO FOLLOW THIS WARNING COULD LEAD TO DEATH OR SEVERE INJURY. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON EQUIPMENT PRIOR TO SERVICING. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING OR OPERATING EQUIPMENT.

Figure 5. Switching Devices Installed in the Transfer Switch (Fixed Type Shown).

Figure 6. Draw-out Switching Device Fully Extended from the Transfer Switch’s Runbacks. (Observe Appropriate PPE and LOTO Procedures When Power Is On.)
1.4 Transfer Switch Catalog Number Identification

Transfer switch equipment catalog numbers provide a significant amount of relevant information that pertains to a particular piece of equipment. The catalog number identification table (Table 2) provides the required interpretation information. An example for an open transition switch is offered to initially simplify the process.

Example: Catalog Number (circled numbers correspond to position headings in Table 2).

```
B I C  8   C3 X 3  0800 X S U
```

The catalog number BIC9C3X31200XSU describes a fixed bypass isolation transfer switch with the switching devices mounted vertically in the enclosure. The intelligence, represented by the ATC-900 is a microprocessor-based logic package. The contactor is used as the switching device and is a 3-pole for each source. The continuous current rating of this equipment is 900A and is applicable at 480 Vac, 60 Hz. The transfer switch equipment is enclosed in a NEMA 1 enclosure and is listed for Underwriters Laboratories (UL) and Canadian Standards Association (CSA) applications. Seismic is also qualified.

Table 2. Transfer Switch Catalog Number Explanation.

<table>
<thead>
<tr>
<th>Type</th>
<th>BI = Bypass Isolation Open Transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanism</td>
<td>C3 = 3 Position</td>
</tr>
<tr>
<td></td>
<td>C5 = In Phase to TDN</td>
</tr>
<tr>
<td>Number of Poles</td>
<td>2 = 2 pole</td>
</tr>
<tr>
<td></td>
<td>3 = 3 pole</td>
</tr>
<tr>
<td></td>
<td>4 = 4 pole</td>
</tr>
<tr>
<td>Logic</td>
<td>E = Draw-out</td>
</tr>
<tr>
<td></td>
<td>X = Fixed</td>
</tr>
<tr>
<td>Voltage</td>
<td>A = 120V, 60Hz</td>
</tr>
<tr>
<td></td>
<td>B = 208V, 60Hz</td>
</tr>
<tr>
<td></td>
<td>E = 600V, 60Hz</td>
</tr>
<tr>
<td></td>
<td>G = 220V, 50Hz</td>
</tr>
<tr>
<td></td>
<td>H = 380V, 50Hz</td>
</tr>
<tr>
<td></td>
<td>K = 600V, 50Hz</td>
</tr>
<tr>
<td></td>
<td>M = 230V, 50Hz</td>
</tr>
<tr>
<td></td>
<td>N = 401V, 50Hz</td>
</tr>
<tr>
<td></td>
<td>O = 415V, 50Hz</td>
</tr>
<tr>
<td></td>
<td>W = 240V, 60Hz</td>
</tr>
<tr>
<td></td>
<td>X = 480V, 60Hz</td>
</tr>
<tr>
<td></td>
<td>Z = 365V, 50Hz</td>
</tr>
<tr>
<td>Enclosure</td>
<td>K = Open</td>
</tr>
<tr>
<td></td>
<td>S = NEMA 1</td>
</tr>
<tr>
<td></td>
<td>J = NEMA 12</td>
</tr>
<tr>
<td></td>
<td>R = NEMA 3R</td>
</tr>
<tr>
<td></td>
<td>D = NEMA 4X</td>
</tr>
<tr>
<td>Certification</td>
<td>U = UL Listed</td>
</tr>
<tr>
<td></td>
<td>R = UL Recognized</td>
</tr>
<tr>
<td>Orientation</td>
<td>C = Contactor</td>
</tr>
<tr>
<td></td>
<td>E = Draw-out</td>
</tr>
<tr>
<td></td>
<td>X = Fixed</td>
</tr>
</tbody>
</table>
| 1.5 Environmental Conditions

1.5.1 Operational Conditions

Normally, an ATS is applied indoors in an electrical equipment room. In the appropriate enclosure, it can be used for outdoor applications where the equipment is subject to falling rain, freezing temperatures, and no greater than 90% humidity (non-condensing). The ambient temperature range for operation is between -20 and 70°C (-4 to 158°F). A 100 watt heater may be required.

Figure 7. Primary Connections on the ATS Switching Device, Four Pole 1200 Amp Shown. The Secondary Connector Is on the Right Side for the 1200 Amp and on the Top Left for the 1600 Amp.

Table 2. Transfer Switch Catalog Number Explanation.
1.6 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/overvoltage/underfrequency/overfrequency (if applicable) setpoint ranges for the nominal voltage and frequency setting.

Bypass
To transfer to another contactor, same source, with no power interruption.

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 and frequency setpoint ranges for the nominal voltage and frequency setting 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 Source 2 to the Source 1.

Source 1
Source 1 is the primary source (normal source, normal power source, or normal).

Source 2
Source 2 is the secondary source (emergency source, emergency power source, emergency, standby, or backup source).

Source 1: Failed or Fails
Source 1 is defined as “failed” when it is outside of its undervoltage/overvoltage/underfrequency/overfrequency (if applicable) setpoint ranges for the nominal voltage and frequency setting.

Source 2: Failed or Fails
Source 2 is defined as “failed” when it is outside of its undervoltage/overvoltage/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 Source 1 to the Source 2 power source.

Trip
Device is not connected to Source 1/ or Source 2. Device is open.

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 transfer switch equipment arrives at its destination undamaged and ready for installation. Crating and packing is designed to protect internal components as well as the enclosure. Transfer switch enclosures are skid mounted and suited for fork lift movement. 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 location and ready for installation.

When the transfer switch equipment reaches its destination, the customer should inspect the shipping container for any obvious signs of rough handling and/or external damage incurred during transportation. Record any external and internal damage observed for reporting to the transportation carrier and Eaton, once a thorough inspection is completed. All claims should be as specific as possible and include the Shop Order and General Order numbers. A shipping label which includes a variety of equipment and customer information, such as General Order Number (GO #) and Catalog Number (Cat #) is affixed to the top of the shipping container. Make certain that this information matches other shipping paper information.

Each transfer switch enclosure is bolted to a rigid wooden pallet. The pallet is open at two ends for movement by a fork lift. The shipment is secured and further protected with shrink wrap. Do not discard the packing material until the equipment is ready for installation.

A plastic bag of documents will be found within the enclosure, usually attached to the inside of the door. Important documents, such as test reports, wiring diagrams, and appropriate instruction leaflets, are enclosed within the bag and should be filed in a safe place. There are also keys for the unit.

2.2 Handling
As previously mentioned, the transfer switch equipment is packaged for fork lift movement. Protect the equipment from impact at all times and DO NOT double stack. Once the equipment is at the installation location and ready for installation, the packaging material can be removed. Once the enclosure is unbolted from the wooden pallet, it can be installed using the lifting provision located on the top of the structure. Be careful not to damage the top or bottom enclosure mounting flanges. Refer to Section 4 of this manual for specific installation instructions.

2.3 Storage
Although well packaged, this equipment is not suitable for storage outdoors. 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°C to 85°C (-4°F to 185°F) with a relative humidity of 80% or less. DO NOT, under any circumstances, stack other equipment on top of a transfer switch equipment enclosure, whether packaged or not.
Section 3: Equipment Description

3.1 General

The ATS consists of:

1. The power panel; consisting of the contactors switching devices with the truck for the ATS in a fixed switch.
2. The voltage selection and transformer pack;
3. The bypass logic panel;
4. The relay panel;
5. The door including the ATC controller, control switches, Kirk-Key, Optional Meter
6. The bus.
7. Terminal Blocks

The panels are interconnected via connector plugs and mounted in an enclosure (Figure 8a). The top and bottom wiring are also shown in Figure 8b and 8c.
3.2 Power Panel (Contactor with Truck)

The power panel consists of a means for making load, power, and neutral connections. The main contacts and the transfer mechanism are all on one steel frame (see Figure 9) called a "truck." The actual power connections are shown in Figure 10.

3.2.1 Main Contacts

The main contacts connect and disconnect the load to and from the different power sources. The main contacts for the Source 1, Source 2, and Load power sources are continuous duty devices that are rated for all classes of loads. In addition, they have high dielectric strength, heavy-duty switching and withstand capabilities. As shown in Figure 10, the top row are the S1 connections, the middle row are the Load connections, and the bottom row are the S2 connections.
3.2.2 Switch Interlocks
Eaton transfer switches are electrically interlocked to prevent the two sets of main contacts from being closed simultaneously except in closed transition mode or transferring to the Bypass function (same source). There are mechanical interlocks inside the contactor to prevent the contactor from closing on S1 and S2 at the same time. It is a three position type contactor (S1-Open-S2). If the switch was manually set to different sources on both contactors at power-up, the logic will immediately open one of the contactors.

3.2.3 Draw-out Interlocks
The ATS switching device is electronically interlocked to the draw-out mechanism to ensure that the switching device is always in the neutral position when connecting or disconnecting it from the line and load stabs. The switch will close on an available source only with the doors closed and latched. When the ATS is isolated or removed, the Bypass will automatically switch by the controller if a power source goes down. To not allow the automatic switching when the ATS is in the isolated or removal state, turn the "Test-Manual Switch" to the Manual Bypass Sources position (3 o-clock). During the test isolation or removal mode, the ATS contactor can be electrically or mechanically operated for testing.

3.2.4 Transfer Mechanism
The transfer switch uses contactor switching devices. A manual indicator on the contactor shows whether it is in the OFF (OPEN) or ON (CLOSED) position (see Figure 11). These are not visible when the doors are closed and latched. Lamps are used to show the user the position of each contactor when the door is closed. In the AUTO or ATS mode, the Controller LEDs are used. Only in Bypass are the lamps used. Doors must be closed and latched to operate the device.

3.2.5 Draw-out Mechanism
The draw-out mechanism is described in detail in Section 6. The draw-out mechanism is designed to operate with the door closed and latched for additional safety for the Locked In and Isolated positions. Figure 12 shows the unit being racked-in or withdrawn from the power runbacks with the door closed and latched. Figure 13 shows the unit with the door open and ready to be removed from the cell.

3.3 Optional Voltage Selection Panel
3.3.1 North American Voltage Selection (120, 208, 240, and 480, 60 Hz), International Voltage Selection (415, 380, 230, 220), and 600 volts
The North American market voltage selection panel consists of multi-tap transformers, contained in a steel case mounted in the transfer switch enclosure (Figure 14). The cover has two connectors on it, with the one on the right being selectable depending on the voltage applied to S1 and S2. The transformer unit is easily removed by removing the two front screws and disconnecting the two plugs. The rear of the transformer enclosure has two flanges that are inserted into two slots. The voltage is selected by simply removing the plug from the default selected voltage on the cover plate and installing the plug to the desired available voltage. Taps are provided for 120 to 480 Vac to satisfy any required North American market application voltage. Ensure that the plug is inserted into the intended voltage at start-up. There is a similar selection panel for international voltages. A 600 volt system has one selection. The voltage selector plug is for line voltage.

Figure 11. Manual Indicators on the Contactor Mechanism.

Figure 12. Draw-out Mechanism or to be Removed.

Figure 13. Unit with the Door Open (to Show Mechanism).
3.4 ATC Controllers

The Controller panel provides the intelligence and supervisory circuits which constantly monitor the condition of both the Source 1 and Source 2 power sources, thus providing the required intelligence for transfer operations (see Figures 15 and 16). Detailed information for controller operation is presented in separate documents:

- ATC-300+ Instruction Book (IB 01602024E - Open Transition Only); and
- ATC-900 Instruction Book (IB140012EN - Open or Closed Transition).

There is an additional Logic Controller for controlling the interlocks, the ATS contactor removal/insertion logic, and the bypass functions. It is located behind the top panel to the far right.

- For current metering, there is a DCT module available that attaches on to the back of the ATC-900, see Figure 22B. The DCT also serves as a 24VDC input for backup power to the controller. See the ATC-900 instruction booklet for more information.

- I/O Modules are available that will increase inputs and outputs (4 in and 4 out per module) if additional I/Os are required. See the ATC-900 instruction booklet for more information.

Figure 14. Optional Transformer Selection Terminals (Shown Connected to the 120 Vac Tap) (Dual Drawout Shown).

Figure 15. ATC-300+.

Figure 16. ATC-900.
3.5 Neutrals and Bus Structure

All 2-pole and 3-pole transfer switches are equipped with 100% rated solid neutral connections. Figure 17a shows the bottom interconnect bus configuration for the Fixed Bypass Isolation Switch. The connections are also available at the top instead of the bottom. The pictures show a 3-pole switch. Figure 17b shows pictures of the neutral and the ground connections. The bus is also marked with S1, S2, and neutral. The 4-pole would have neutral on the rear copper. Figure 17c shows pictures of the Dual Drawout bus structures. The Dual Drawout connects can be changed to accommodate all top, all bottom, or a mixture of both. Changing the terminals in the field can be accomplished with directions in Section 4.5. With a standard Dual Drawout type, S1 and Load are shipped on Top and S2 is shipped on the bottom.

Figure 17a. 3 Pole Fixed Switch Configurations (600-1200A).

Figure 17b. Neutral and Ground Copper.

Figure 17c. Dual Drawout Bus Structures.
3.6 Features/Options

3.6.1 Some Popular Features for the Automatic Transfer Switch

A variety of standard and optional features are available for Eaton ATSs. All features or combinations of features may not be available on specific ATSs. All features and/or accessories are Underwriters Laboratories (UL) listed unless noted. The primary function of the controllers is to accurately monitor power sources and provide the necessary intelligence to operate a transfer switch in an appropriate and timely manner. In addition, the controllers provide useful present and historical data, reliable two-way communications, and programming through the device’s faceplate or communications option. They feature proprietary microprocessor technology to provide and maintain superior precision and versatility during both programming and data access.

Eaton Transfer Switches are provided as standard with Source 1, Source 2, and Load Circuit solderless screw-type terminals for power cable connection. Alternate terminal wire sizes may be available dependant on transfer switch type and ampere rating.

SPD Surge Devices are available that gives protection for surge current capacity by providing a low impedance surge path to ground while supporting the rated voltage.

3.6.1.1 Standard Features

The following is a list of a very few popular standard features of the Controller. Please see the specific controller Instruction booklets for more standard features. A variety of programmable features are available to meet a wide variety of application requirements. Individual features or feature combinations provide the intelligence required to tailor switches to individual needs. The features are all activated, except the closed transition option or an option that the switch cannot accomplish, i.e. Time Delay Neutral on a two position contactor. The specific variable setpoints associated with standard and factory activated features are stored in a nonvolatile memory. Activated feature setpoints are available for customer adjustment.

1. Time Delay Normal to Emergency (TDNE)
   This feature provides a time delay when transferring from the Source 1 to the Source 2 power source. Timing begins when Source 2 becomes available. It permits controlled transfer of the load circuit to Source 2.

2. Time Delay on Engine Starting (TDES)
   This feature provides a time delay of the signal to initiate the engine/generator start cycle in order to override momentary power outages or voltage fluctuations of Source 1.

3. Time Delay Emergency to Normal (TDEN)
   This feature provides a time delay of the re-transfer operation to permit stabilization of Source 1. Timing begins when Source 1 becomes available. If Source 2 fails during timing, then re-transfer is immediate, overriding the time delay.
4. **Time Delay for Engine Cool-down (TDEC)**
   This feature provides a time delay of the signal to initiate the engine/generator stop cycle after the re-transfer operation. This allows the engine/generator to cool down by running unloaded. Timing begins on completion of the re-transfer cycle.

5. **Source Monitoring and Protection**
   This feature provides monitoring and protection based on the Source 2 voltage and/or frequency setpoints. All feature five functions are “failsafe” operations. Features also include Phase Over/Under voltage/frequency, reversal, unbalanced, loss, and synchronization.

6. **Test Operators**
   Eaton ATSs are provided with a Test Pushbutton that simulates a loss of the Source 1 power source as standard.
   Programmable setpoints include:
   1. Load, No Load Testing, or Disabled; and
   2. Engine run time is set able.

7. **Time Delay Emergency Fail (TDEF)**
   This feature provides a time delay that prevents a connected emergency source from being declared “failed” in order to override momentary generator fluctuations.

8. **Time Delay Bypass Pushbutton**
   This feature provides a way to bypass the TDNE, the TDEN, or the TDEC time delays (ATC-300+). For the ATC-900, by pushing the buttons, it will reduce any or all of the programmed time delays to zero.

12. **Power Source Annunciation**
   This feature provides LEDs to give switch position and power source availability indications. The MIMIC bus is shown with LEDs while the TFT display on the ATC-900 lists other data such as voltage.

   **Switch Position**
   Provides LEDs to indicate the switch position.

   **12C. Source 1 - Source Connected**
   This feature provides a green LED that, when lit, indicates the load is connected to Source 1.

   **12D. Source 2 - Source Connected**
   This feature provides a red LED that, when lit, indicates the load is connected to Source 2.

   **Power Source Availability**
   Provides LEDs to indicate if a power source is available. LEDs may be integral or separate from the controller.

   **12G. Source 1 - Available**
   This feature provides a white LED that, when lit, indicates Source 1 is available.

   **12H. Source 2 - Available**
   This feature provides an amber LED that, when lit, indicates Source 2 is available.

15. **Switch Position Indication**
   This standard feature provides a contact that indicates if the power-switching device is in the “Open” or “Closed” position for S1 and S2.

23. **Plant Exerciser (PE)**
   This feature provides a means for automatic testing of the engine/generator set or standby power system. All programmed time delays will be performed during plant exerciser operations see the controller’s instruction booklet.

26D. **Go to Emergency**
   This feature provides the capability for an external contact opening to initiate a load power transfer to the Source 2 power source. This includes starting the engine/generator, performing the programmed time delays, and the transfer operation. Re-transfer will occur when the external contact is closed or under a “failsafe” condition. A connection point on the controller for the connection of an external contact is included.

29J: **Type of Operation (MANTR)**
   This standard feature provides for a selection between an automatic transfer and re-transfer mode or a manual pushbutton re-transfer to Normal from the Emergency Source mode. If this option is not selected the factory default selection is automatic.

35A. **Pre-transfer Post Transfer, or Pre/Post Transfer Signal with 1 N.O. and 1 N.C. Contacts**
   This feature on the ATC-900 provides pre-transfer signal and includes one (1) N.O. and one (1) N.C. contact.

36. **Emergency Inhibit (S2 Load Shed)**
   This feature enables the Emergency Inhibit control input to inhibit transfers to the Emergency Source.

---

**NOTICE**
WITH RESPECT TO THEIR USE IN THIS DOCUMENT AND AS THEY RELATE TO AUTOMATIC TRANSFER SWITCH OPERATION, THE FOLLOWING WORDS OR PHRASES ARE DEFINED:

**CAUTION**
CHANGING THE SYSTEM NOMINAL VOLTAGE OR FREQUENCY SETPOINTS WILL CAUSE PICKUP AND DROPOUT SETPOINTS TO CHANGE AUTOMATICALLY TO NEW DEFAULT VALUES.

**Time Delay Neutral (TDN)**
This feature provides a time delay in the transfer switch Neutral position when both contactors are open. This delay takes place when the load is transferred in either direction to prevent excessive in-rush currents due to out-of-phase switching of large motor loads. This feature is not available with the Neutral Load Sense Delay (TDNLD) feature.
Load Voltage Decay
This feature on the ATC-900, utilizes the load voltage measurements to sense back EMF that is generated when the transfer switch is in the Neutral position. It provides a delay in transfer in either direction if an unacceptable level is sensed as established by a customer programmed level. The transfer will not take place until the back EMF decays below the acceptable programmed level. This feature has a separate setting of enabling or disabling the operation. If disabled, the transfer switch will not delay in the Neutral position and will transfer between the sources as fast as possible. This feature is not available with the Time Delay Neutral (TDN).

In-Phase with Default to Time Delay Neutral
This feature provides an in-phase transfer with a default to a time delay neutral transfer which ensures that the ATS will complete a transfer whether or not the two live sources can synchronize. When in-phase with default to time delay in neutral is set and source synchronization does not occur in the specified amount of time, the transfer will default to a time delay in neutral transfer and the Alarm relay will energize and the failure will be logged into the Transfer History as either “Sync Fail - Freq” or “Sync Fail - Phase” depending on whether the frequency difference or the phase difference was excessive. This option allows the user to configure the switch in the field to be In-Phase only, Time Delay Neutral only, or In-Phase with default to TDN (factory setting).

Potential Transformer (PT) Ratio
This feature allows external voltage transformers to be used on the ATC-900’s source and load sense inputs. Once this option is enabled, the PT Ratio setpoint can be adjusted in steps of 1, between 2:1 and 500:1. Also, when this option is enabled, the Nominal System Voltage setting will be fixed at 120 or 110 volts, depending upon the Nominal System Frequency setting. If the Nominal System Frequency setting is 60 Hz the Nominal System Voltage will be fixed at 120 volts and all voltage pick-up and drop-out setpoints will be based upon the 120 volt level. The same is true of a Nominal System Frequency of 50 Hz whose Nominal System Voltage will be fixed at 110 volts. The metering display will use the PT Ratio value to calculate and display the load and source voltages.

Closed Transition
Closed Transition is a feature that will temporarily parallel two live sources in a make-before-break scheme when performing a transfer. This achieves a transfer between sources with no power interruption. Both sources must be synchronized in frequency, phase, and voltage before the transfer is initiated.

3.7 Enclosure
The rugged steel switch enclosure is supplied with hinges to insure proper support of the door and door mounted devices. The hinges have removable hinge pins to facilitate door removal and all doors contain connectors for easy electrical reconnect. The doors are supplied as standard with padlock latches. Cable entry holes are the customer’s responsibility.

The door is used to mount a variety of lights, switches, and push buttons, depending upon the options required for a particular switch. All switch doors are supplied with a heavy duty plastic accessory panel in place, whether or not external devices are required. When lights, pushbuttons, or switches for options are required, they are normally mounted in the plastic door mounted panel.

Transfer switch enclosures and some internal steel mounting plates, such as the transformer panel mounting plate, go through a pre-treatment cleaning system prior to painting to insure a durable finish. Should the enclosure become scratched and in need of touch up paint, use ANSI 61. All remaining steel is galvanized. The standard switch enclosure is NEMA Type 1 for general indoor use (Table 3).

<table>
<thead>
<tr>
<th>NEMA TYPE</th>
<th>DESIGN</th>
<th>PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Indoor</td>
<td>Enclosed Equipment</td>
</tr>
<tr>
<td>3R</td>
<td>Outdoor</td>
<td>Rain, Ice Formation</td>
</tr>
<tr>
<td>12</td>
<td>Outdoor</td>
<td>Water and Dust</td>
</tr>
<tr>
<td>4X</td>
<td>Outdoor</td>
<td>Corrosive Agents</td>
</tr>
</tbody>
</table>

There are many other options for these switches such as Phase Unbalanced/Loss, metering, Auto/Manual Operation, Remote Annunciator Control (RAC), Monitor, Gateways, and Surge devices. Please consult factory for more features and options.

3.8 Standards
Eaton transfer switch equipment is listed for application by UL and CSA. In addition, Eaton Automatic Transfer Switches are listed under Standard UL 1008. This standard covers requirements for Automatic Transfer Switches intended for use in ordinary locations to provide for lighting and power as follows:

a. In emergency systems, in accordance with articles 517 and 700 in the National Electrical Code (NEC), American National Standards Institute/National Fire Protection Association (ANSI/NFPA) 70 and the NFPA No. 76A and/or
b. In stand-by systems, in accordance with article 702 of the NEC and/or
c. In legally required stand-by systems in accordance with article 701 of the NEC.

Eaton Automatic Transfer Switches are available to meet NFPA 110 for emergency and stand-by power systems, and NFPA 99 for health care facilities when ordered with the appropriate options.

3.9 Power Off Buffer
For faster switching times when power is removed from the switch, there is a non-maintenance buffer added that keeps power onto the Logic Controller, not the ATC, for about 30 seconds. There is an option to keep the ATC-900 power on for 19 seconds after power loss and this will keep the communications active. This option will require the DCT module. The additional time that the Logic Controller unit is powered will speed up the switching time of the transfer, when a source is available, because the Logic Controller will not have to "wake-up." It is a small device and measures 2.5” W x 5.1” H x 4.8” D. The buffer is din-rail mounted and is factory set (22-24 Volts) with no maintenance required. It contains no batteries. The green LED on the Buffer will flash when the unit is being discharge or charged, otherwise it will remain on.
Section 4: Installation and Wiring

4.1 General
Eaton transfer switches are factory wired and tested. Installation requires solidly mounting the enclosed unit and connecting the power cables and auxiliary pilot circuits. Physical mounting procedures and power cable connections are covered in this section. All other required wiring or electrical connection references are covered in a separate Customer Wiring Diagram packaged with the transfer switch.

Locate the wiring booklet, review it, and keep it readily available for reference purposes during installation and testing. 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 7 of this instruction manual.

**WARNING**

BE CERTAIN THAT THE STEEL POWER PANEL BARRIERS ARE PROPERLY INSTALLED BEFORE THE TRANSFER SWITCH EQUIPMENT IS PUT INTO SERVICE. THE BARRIER PROVIDES PROTECTION FROM DANGEROUS VOLTAGE 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 transfer switch equipment. Avoid locations that are moist, hot, or dusty. However, Eaton offers enclosure designs that can be used in special environments. If there are any doubts as to the suitability of the location, discuss it with your Eaton representative.

Check to make certain that there are no pipes, wires, or other hazards in the immediate area that could create a problem. The panels provide ample room for rear cable entry from top, bottom, and sides. At no time should cable be routed to retard the action of relays or cover the logic in a way that restricts adjustments.

Maintain proper electrical clearances between live metal parts and grounded metal.

For installation and maintenance purposes, the Source 1 and Source 2 power sources must have an overcurrent protective device upstream of the transfer switch, unless overcurrent protection is integral to the switch.

The dimensions of the transfer switch are an important consideration in determining proper location selection.

4.3 Unpackaging and Inspection

**CAUTION**

EXTREME CARE SHOULD BE TAKEN TO PROTECT THE TRANSFER SWITCH FROM DRILL CHIPS, FILLINGS, AND OTHER CONTAMINANTS WHEN MAKING THE CABLE ENTRY HOLES AND MOUNTING THE ENCLOSURE TO PREVENT COMPONENT DAMAGE OR A FUTURE MALFUNCTION.

**NOTICE**

CABLE ENTRY HOLES ARE NOT PART OF THE ENCLOSURE WHEN SHIPPED FROM THE FACTORY AND MUST BE PROVIDED IN THE FIELD, EITHER BEFORE OR AFTER MOUNTING THE ENCLOSURE.

Proceed with the following four steps.

**Step 1:** Carefully uncrate the transfer switch. If damage is visible, please contact your local Eaton sales representative or the factory.

**Step 2:** Open the door by inserting a tool into the bottom door opening and pull up to release the door lever as shown in Figure 18. This method is only used to open the door when the unit is initially shipped and with no power (S1 & S2) to the switch. Visually verify that there are no broken or damaged components or evidence of distorted metal or loose wires as a result of rough handling.

**Step 3:** A label on the door provides specifications for your transfer switch. Verify that these specifications comply with your requirements.

**Step 4:** Remove any braces or packing used to protect the transfer switch or internal components during shipping.

With the enclosed transfer switch equipment unpacked and ready for mounting, proceed with the following steps.

**Step 1:** Mounting and cabling access is best provided by removing side and rear covers (when applicable). See Section 9.3 for cover removal instructions.

**Step 2:** Gently maneuver the switch into its location using all of the supplied lift brackets.
Step 3: Bolt the enclosure to the base. Use separate seismic washers (Option 42 only) if Seismic Uniform Building Code (UBC) Zone 4 certification is desired (Figure 19a and 19b), and secure with 1/2-13 UNC Grade 5 hex bolts. Figure 19a is using seismic brackets and Figure 19b is using seismic washers. The unit was Seismic tested to 120% of the rating.

Step 4: Tighten bolts to 50 ft-lbs (68 Nm).

Step 5: Double check to ensure that all packing and shipping material has been removed.

Figure 19a. Seismic Tested and Approved Brackets.

Figure 19b. Interior Seismic Washers Shown.

4.5 Modifying Power Cable Connections on a Dual Draw-Out Switch (1200 Amp Shown)

The standard shipped configuration unit has S1, S2, and Load connections on the top or on the bottom. Section 3.5 shows several bus connections for a Fixed and Dual Drawout switch. The bus is labeled inside the unit. Figure 20a (A-E) is a procedure for changing the copper orientation to allow service from the top instead of the bottom, etc. This is only available on the Dual Drawout model. Figure 20b shows the ground and neutral assemblies.

Note: Due to the S1 and S2 copper bus extensions being affixed to the fixed vertical bus at the run-backs on the 1200 amp frame dual drawout bypass, the user will need additional hardware to relocate the extensions from top entry to bottom entry (or vice versa). This is true for both 600A and 1200A bus designs. The user will need the following hardware (quantity in parentheses):

- 600A per phase: (3) 3/8 - 16 X 1 ¼” hex head bolt, (3) 3/8 lock washer, (3) 3/8 - 16 heavy hex nut, (6) 3/8 flat washer;

On the 1600 amp frame bypass, the extensions are not affixed to the run-backs, so the same hardware can be used when the extensions are moved. The Copper bus is tightened to 20 ft-lbs.
Figure 20a. Procedure for Changing Copper Orientation.

A. Remove Copper.
B. Remove Lug Pad.
C. Mount Lug Pad on Same Face of Standoff, but in Opposite Direction as Shown.
D. Reinstall Copper Extension.
E. Torque All Copper to Copper Connection to 400 in. lbs.
Figure 20b. Neutral and Ground Copper.
Proceed with the following steps:

**Step 1:** Verify that the line and load cables comply with applicable electrical codes.

**Step 2:** Verify that the transfer switch rated current and voltage (see identification plate on the door of the transfer switch) agree with system current and voltage.

**Step 3:** After the transfer switch is mounted, provide the conduit or cable openings as required. Ensure that no metal filings contaminate the transfer switch components.

**Step 4:** Test all power cables before connecting them to the unit to insure that the conductors or the cable insulation have not been damaged while being pulled into position.

**Step 5:** Carefully strip the insulation from the power cables. 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. Refer to Figure 19 for the approximate locations of the power connections.

Power cables are to be connected to solderless screw type lugs located on the transfer switch switching devices. Refer to the separate Customer Wiring Diagrams supplied with the transfer switch equipment for power termination. Verify that the lugs supplied will accommodate the power cables being used. Also verify that the cables comply with local electrical codes. Standard transfer switch equipment, as supplied from the factory, will accommodate the wire sizes shown in Table 4.

### Table 4. Transfer Switch Equipment Wire Sizes.

<table>
<thead>
<tr>
<th>TRANSFER SWITCH AMPERE RATING</th>
<th>WIRE SIZE RANGES &amp; NUMBER OF CABLES PER PHASE</th>
<th>TERMINAL TEMPERATURE RATING °C (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1</td>
<td>#14 3/0</td>
</tr>
<tr>
<td>200</td>
<td>1</td>
<td>#6 300KCMIL</td>
</tr>
<tr>
<td>400</td>
<td>1</td>
<td>1/0 750</td>
</tr>
<tr>
<td>400</td>
<td>2</td>
<td>1/0 250</td>
</tr>
<tr>
<td>1200-1600</td>
<td>1/0 750</td>
<td>90 (194)*</td>
</tr>
</tbody>
</table>

* Cable must be 90C rated but shall be determined based on the ampacity of the wire rated at 75°C.
Section 4.5 Customer Interface Terminal Blocks

There are terminal blocks inside the unit for customer interface shown in Figure 21. The terminal blocks provide a set of auxiliary form C position contacts for each contactor (ATS and Bypass). Up to two more Form C position contacts can be brought out as an option. There are also terminal blocks for Engine Start, Go to S2, power (line and common) for any AC required up to 7 amps continuous and other interfaces. These terminal blocks shown below are for the ATC-300 type switches. The ATC-900 type switches bring the I/O connections also out to terminal blocks, see the switch drawings. The 1600 amp type switch has an easy slide out panel with all of the terminal blocks on it for easy access. Figures 22a and 22b show the rear view of the ATC-300+ and the ATC-900 controllers.

<table>
<thead>
<tr>
<th>Option 14 Contact Ratings:</th>
<th>RESISTIVE</th>
<th>GENERAL USE</th>
<th>MOTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 VAC</td>
<td>10A</td>
<td>7A</td>
<td>1/3 hp 240 Vac</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/6hp 120 Vac</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option 15 Contact Ratings:</th>
<th>RESISTIVE</th>
<th>LAMP</th>
<th>INDUCTIVE</th>
<th>MOTOR</th>
<th>IN-RUSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 VAC</td>
<td>10A</td>
<td>2A</td>
<td>1A</td>
<td>3A</td>
<td>1.5A</td>
</tr>
<tr>
<td>250 VAC</td>
<td>10A</td>
<td>1.5A</td>
<td>0.7A</td>
<td>4A</td>
<td>2A</td>
</tr>
</tbody>
</table>

**CAUTION**

ENSURE THAT SWITCH IS PROPERLY GROUNDED. IMPROPER GROUNDING CAN CAUSE EQUIPMENT DAMAGE.

Step 6: Tighten the cable lugs to the torque identified on the label affixed to the door. For type AB-750-4 terminal lugs, the value is 550 in/lbs.

Step 7: Make the necessary connections of any options using the wiring diagrams supplied with the unit.

**WARNING**

POWER CONDUCTORS AND CONTROL WIRING MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DEENERGIZE ALL POWER AND CONTROL CIRCUIT CONDUCTORS BEFORE BEGINNING TO PERFORM ANY WIRING ACTIVITY TO OR WITHIN THE ATS EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON EQUIPMENT PRIOR TO SERVICING. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

Power sources, load conductors, and control wiring should be connected to locations as indicated in the customer wiring diagram supplied with the ATS equipment.

**CAUTION**

ENSURE THE ATS VOLTAGE IS SET CORRECTLY. IT SHOULD BE THE SAME AS THE SOURCE 1 AND SOURCE 2 LINE VOLTAGES. OPERATING THE EQUIPMENT ON IMPROPER VOLTAGE CAN CAUSE EQUIPMENT DAMAGE.

Once the ATS equipment has been installed and wired, perform the initial mechanical and electrical procedures as outlined in Section 6 to verify that the equipment is installed and operating properly.

**CAUTION**

IMPROPER POWER CABLE CONNECTIONS CAN CAUSE EXCESSIVE HEAT AND SUBSEQUENT EQUIPMENT FAILURE. ENSURE ALL CONNECTIONS ARE TORQUED TO VALUES AS INDICATED ON THE LABEL AFFIXED TO THE EQUIPMENT DOOR.

**WARNING**

ENSURE THAT SWITCH IS PROPERLY GROUNDED. IMPROPER GROUNDING CAN CAUSE EQUIPMENT DAMAGE.

For more information visit: www.eaton.com
Figure 22A. Bypass Contactor ATS (Rear View of ATC-300+ Controller).

Figure 22B. Bypass Contactor ATS (Rear View of ATC-900 Controller with a DCT Module).
4.6 Voltage Selection Adjustment

Certain devices, such as the voltage selection panel, sensing relays, and timers need to be set and/or calibrated prior to placing the transfer switch equipment into service. Adjustments for logic devices are described in the separate instructional document dedicated to the specific logic being used. Voltage selection adjustments are described here.

Figure 23. Voltage Selection Adjustment (120Vac Is Shown Selected) (Dual Drawout Shown).

The voltage is selected by simply removing the plug from the default selected voltage on the cover plate of the transformer panel and installing the plug to the desired available voltage. The 600 volt is a single tap. The voltage selection can be domestic or international voltages. Some Surge protection and relays will require a one tap configuration on the transformer. See Section 3.3 for more information.

CAUTION

BE SURE THAT THE CORRECT VOLTAGE IS SELECTED TO MATCH THE SYSTEM VOLTAGE. AN IMPROPER SELECTION AND/OR CONNECTION COULD RESULT IN EQUIPMENT DAMAGE.

4.7 Wiring

CAUTION

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 TRANSFER SWITCH EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON EQUIPMENT PRIOR TO SERVICING. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

Power sources, load conductors, and control wiring should be connected to locations as indicated in the Customer Wiring Diagrams supplied with the transfer switch equipment.

4.7.1 Customer Interface Terminal Blocks

There are terminal blocks inside the unit for customer interface. The terminal blocks provide a set of auxiliary form C contacts for each contactor (ATS and Bypass). Up to two more Form C contacts can be brought out as an option. There are also terminal blocks for Engine Start, Go to S2 power (line and common) for any AC required up to 7 amps and other interfaces. See Figure 21.

TB3 AC Neutral
TB4 Auxiliary Contacts
TB6 (1 and 2) Engine Start
TB6 (11 and 12) Go To S2
TB6 (15 and 16) S2 Inhibit (Option 36)
TB6 (7 and 8) Alarm (Option 81A)
TB7 AC Line (120 volts)
TB21 120VAC Line In for UPS
TB22 120VAC Com In for UPS
TB23 120VAC GND In for UPS

Note: Prior to making the engine start connection to the switch on bypass isolation units if provided as an option, set the engine generator controls selector switch in the OFF position to prevent an unwanted engine start. A contact, if provided, closes between these terminal blocks when an engine start signal is provided by the ATS logic.

4.7.2 Closed Transition Connections

If the closed transition option is ordered, the unit will arrive from the factory with the Closed Transition provided. The user has many open transition options including In-Phase, Time Delay Neutral, and Low Voltage Decay. One can set an individual setting or have them work together in a serial fashion. See the ATC-900 instruction booklet.
Section 5: Operation of the Bypass Isolation Transfer Switch

5.1 General

A transfer switch provides main contacts to connect and disconnect the load to and from the Source 1 and Source 2 power sources.

5.2 Operator Panel

The design of this transfer switch allows quick removal of the ATS contactor for inspection or maintenance or, if required, quick replacement. The Bypass Isolation Switch has two operator panels on the top (Bypass) door (see Figure 24) with switches and lights (see Figures 25 and 26). The Kirk-Key must be in (bottom) and turned in a locked position, (latch opening is closed) for the system to operate normally in the ATS position. The key of the Kirk-Key can be removed in this position (counter clockwise with latch closed) if desired. The following descriptions are for those features that are standard with the Bypass Isolation Switch.

Figure 25. Lights Including Manual ATS.

The top side of the door contains the lights, and abbreviated instructions. The lamps are used when the switch is in the bypass position only. All lamps will be off when the Bypass/Maintenance Switch is in the “ATS” position. The ATC controller will be used when the switch is in the ATS position. The controller and the lamps are used in the Bypass position for several reasons one being manual operations. Keep in mind that the switch is a dual switch which means that the controller will run (auto control) both the ATS and the Bypass including if the switch is an open transition or a closed transition. Both contactors must be in for the unit to run in the closed transition mode. If one contactor is in the unit, the switch will operate as an open transition and the controller and terminal block should be set to the “open” mode. If the ATS is removed for some reason, there is no reason to remove the Bypass unit and relocate it to the ATS bottom cell; just use the Bypass unit in the top cell as the open transition switch. The “ATS Locked In” and the “ATS” light will remain illuminated when the switch is in the “ATS” position or when power is first turned on for 20 seconds. If option 29G (Manual Operation) is included, then this switch is a three position switch which includes a white lamp. The Figures 24 and 25 show this popular option. The bottom of the top door contains the following standard features:

1. Light to indicate if the Source 1 power source is available.
2. Light to indicate if the Source 2 power source is available.
3. Light to indicate if the Bypass contactor Source 1 position is energized, that is, the Source 1 switching device in the automatic transfer switch is closed.
4. Light to indicate if the Bypass contactor Source 2 position is energized, that is, the Source 2 switching device in the automatic transfer switch is closed.
5. Light to indicate that the ATS unit is locked in.
6. Light to indicate that the ATS is withdrawn or isolated from the S1 or S2 power stabs but still connected for testing. When the secondary connector is not connected, the unit is in the removed position and the “ATS Isolated” light will start flashing.
7. Light to indicate that the ATS door, the Bypass door, or both doors are not latched. The doors must be closed and latched for unit to operate.
8. Two lights associated with the Bypass/Maintenance functions.

Figure 24. Top Bypass Door. Option 29G Is Also Shown.

The top left side of the door contains the ATC-300+ or the ATC-900 controller. It also contains a plastic control panel with some standard features and also additional optional features. The door contains three switches for performing bypass, ATS testing, and Bypass Manual mode.
5.4 Transfer to Bypass (Bypassing the Transfer Switch)

**WARNING**

THE CLOSED TRANSITION PRODUCT CONTAINS A SPECIAL CONTACT ARRANGEMENT (OVERLAPPING CONTACTS). MISUSE CAN RESULT IN DEATH, SEVERE PERSONAL INJURY, AND/OR PROPERTY.

5.4.1 Source 1 ATS to Source 1 BYPASS and Back to Source 1 ATS

1. All doors must be closed and latched. The Door Open light should not be flashing.

2. Turn Bypass/Maintenance Switch to "Transfer to Bypass." The Transfer to Bypass amber light will illuminate when the Bypass contactor is closed to S1 and the ATS contactor is tripped. The intelligence/supervisory circuits will constantly monitor the condition of both the Source 1 and Source 2 power sources and automatically initiate a transfers of power from the Source 1 to the Source 2 on the Bypass contactor. The Bypass unit is then an automatic transfer switch. The Bypass/ATS light will now be on showing that the ATC controller is now actively controlling the Bypass part of the switch. Figure 26 shows the amber light on the top door.

3. Turn the Kirk-Key clockwise (3:00) within 1 minute of switching to Bypass. If not within 1 minute simply switch back to ATS and then back to Bypass. If desired, draw-out the ATS contactor (see Section 6).

4. Inspect and/or perform the needed maintenance on the ATS contactor.

5. Rack-in the ATS contactor (see Section 6) until the ATS is locked in. The "ATS Locked In" Green lamp will be on when the ATS is sufficiently racked in. This lamp is important because the contactor must be racked in all the way to a locked position or the unit will not operate. One can check to see if both contactors are racked all the way to a locked position by pushing the "Lamp Test" button on the door. If the lamps all light the contactors are locked in. If all the lamps light except for the "Locked In" is flashing, one of the contactors, probably the ATS one is not racked all the way. Turn the Bypass/Maintenance Switch to "Auto." The Kirk-Key must be inserted and turned counterclockwise (9:00) closing the draw-out opening or the unit will not go back to the Auto mode. The key of the Kirk-Key can be removed in this position (counter clockwise with latch closed) if desired. The Auto light will illuminate when the ATS contactor is closed to S1 and the Bypass contactor is tripped. The "ATS Locked In" and the "AUTO" lights will remain illuminated for a short time after switching back to Auto mode.

Note: If most of the lamps start flashing, that is a signal that the ATS is not racked in to the locked position or the Kirk-Key is not in the key hole and turned to it's latch close position.

6. The ATS contactor is now back in automatic operation. The intelligence/supervisory circuits will constantly monitor the condition of both the Source 1 and Source 2 power sources and automatically initiate transfers of power from the Source 1 to the Source 2 on the ATS contactor.

5.4.2 Source 2 ATS to Source 2 BYPASS and Back to Source 2 ATS

7. The ATS Contactor (S2) device can be bypassed and isolated by the exact same sequences as shown for S1 in 5.4.1.
5.5 Test-Manual Switch Operation

After Draw-out, the ATS can be tested using the Test-Manual Switch. The Test-Manual Switch can also function as a manual (electrical) switch to close the Bypass contactor to S1 or S2. This switch will also reset the ATC controller by moving the switch to “Manual Bypass” and back to the off position.

5.5.1 Testing the ATS when Isolated or Removed

To test the ATS after Draw-out:

1. When in Bypass mode and with the ATS drawn-out, switch the Test-Manual Switch to the “Test ATS Isolation Position”. The Bypass contactor will remain in the patented automatic mode.

2. Electrical test can be performed on the ATS contactor by using the Manual Source Select switch. By slowly switching to S1 or S2 the contactor will close or in the open position at “off” after a slight delay. Since it is in test, only one power source is require to enable the switching of the ATS to S1, Neutral, or S2. Although the “Off” position is where the switch starts out, the contactor will not go to the open state until the S1 or S2 is chosen and then back to the “Off” position. This is the same for when the 29G option is on the switch. The 29G allows for the electrically manual operation of the ATS when the doors are closed. Caution should be applied since one could remove power from the load when the switch is placed in the Off position which is Trip or Neutral.

3. Only when the ATS is in the isolated position or removed, a non-electrical manual test may also be performed by inserting the handle on the shaft of the left side of the mechanism and depressing the buttons on the mechanism. See section 5.5.3 for instructions and pictures. Be sure the Switch is still in “Test ATS Isolation” or removed position when doing these manual tests. When the “Test-Manual Switch” switch is placed back in the off position, the unit will trip if it is closed or in the open position at “off”. Therefore, using the handle will not function as the unit will electrically want to trip. See Section 5.5.3 for full instruction on the manual operation of the contactor. If the ATS is removed caution should be taken as the stabs in the back of the cell are powered if there is power to S1 or S2.

5.5.2 Electrically Manual Mode for the Bypass

To switch the Bypass manually when the ATS is isolated or racked-out.

Unlike when using the “Testing the ATS,” the doors must be closed and latched for the Bypass Manually to function. The Bypass Manually switches live power (S1 or S2) and caution should be used. Both Doors must be closed and latched before Bypass switching will occur. The manual operation of the Bypass could remove power from the Load because of the three position contactor at the neutral position even if both sources S1 and S2 are on. Unlike the ATS, the manual operation will work with either source on but only to that source and to trip with either source on but only to that source and to trip. If a source is not available, the unit will not manually switch to that position.

1. When in Bypass and with the ATS racked-out and isolated (ATS Isolated light will be illuminated), switch the Test-Manual Switch to the “Manual Bypass Sources”. The manual operation of the Bypass unit will result in the controller being inactive in controlling the Bypass contactor. The ATC-900 and the ATC-300+ controller will show “Monitor Mode” Both controllers will still follow the actions on the mimic bus LEDs. The Bypass/ATS light will now be flashing showing that the ATC is inactive (Figure 24).

**WARNING**

THE MANUAL OPERATION OF THE BYPASS COULD REMOVE POWER FROM THE LOAD AT THE OFF (TRIPPED) POSITION. THE MANUAL OPERATION WILL ONLY CLOSE TO THE SOURCE THAT HAS POWER. THE DOORS MUST BE CLOSED AND LATCHED.

2. To select the source using the Manual Source Select switch. Slowly close the Bypass contactor to the desired source. The “Bypass Source 1 or Source 2” lights will be illuminated as the “Manual Select Switch” is used (see Figures 25 & 26). In order for the switch not to transfer directly when the Test-Manual Switch is moved to Manual Bypass Sources, it is latched until one moves the switch to the already closed position of the contactor. Once there, then the switch can be move to open and close the contactor. To repeat, in Manual Bypass operation, the switch will only close to the source that has power.

3. To disable manual and operate the Bypass contactor with the controller active (automatic), turn the Test-Manual Switch to “Off”. The Bypass switching device is now back in automatic operation and the controller will close the appropriate side of the switch (S1 or S2). Turning this switch to the “Manual Bypass” position and back to “Off” will also reset the Controller. This is a safety feature for resetting the controller with the doors closed and latched.

**CAUTION**

THE MANUAL OPERATION OF THE BYPASS UNIT WILL RESULT IN THE CONTROLLER BEING INACTIVE IN CONTROLLING THE BYPASS CONTACTOR.

**WARNING**

HAZARDOUS VOLTAGES IN AND AROUND TRANSFER SWITCH EQUIPMENT DURING THE TROUBLE SHOOTING PROCESS CAN CAUSE PERSONAL INJURY AND/OR DEATH. WHILE ENERGED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

**WARNING**

HIGH VOLTAGE ASSOCIATED WITH OPERATIONAL TRANSFER SWITCH EQUIPMENT PRESENT A SHOCK HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. WHILE ENERGED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

In addition, improper operation of the generator set presents a hazard that can cause severe personal injury or death. Observe all safety precautions in your generator set operations and installation manuals.
To manually operate.

1. With the ATS drawn-out and the ATS Isolated light illuminated, one can manually switch the ATS contactor.

2. TO TRIP: Depress the “trip” button located on the operating mechanism of the contactor to bring the contactor to neutral (trip) position. Figure 27 shows the manual trip location on the mechanism.

3. TO CLOSE ON S1: Locate the manual lever on the left side of the contactor as shown in Figure 28.

4. Attach the handle to the manual lever.

5. Rotate the lever up to go to Source 1.

6. Depress the “trip” button located on the operating mechanism of the contactor to bring the contactor to neutral (trip) position.

7. TO CLOSE S2: Depress the “select” button located on the operating mechanism of the controller and rotate the lever up keeping the “select” button depressed to go to Source 2. This procedure is shown in Figure 29.

8. Once the manual operation is complete and automatic operation is desired, trip the contactor, close and latch doors, and rack-in.

9. Follow the operation procedure in Section 5 to ensure proper automatic operation.

Note: Closing the contactor to S1 or S2 will require the lever to be pushed up. The only difference when going to S2 is also pushing in the select button. There are directions on the front of the Mechanism.
Section 6: Draw-out, Racking-in, and Removal of the ATS Contactor

6.1 Installing a Draw-out (ATS) Switching Device

The Fixed Bypass Isolation Switch is equipped with one draw-out contactor switching devices. The bottom contactor (ATS) is interlocked and removable as shown in Figure 30. The Bypass contactor is identical to the ATS contactor except it is fixed or a draw-out type. To remove the Bypass contactor, all power must be removed as it does not have the safety interlocks like the ATS.

The truck rolls on internal rails as shown in Figure 31. The door is closed until the ATS is in the Isolated position. The door can remain closed or opened in the Isolated position for testing. To further remove, the door is required to be opened.

To install the contactor, check the truck to be sure the unit is fully opened. Using a 3/8 inch square drive and ratchet with extension, which is not provided, make sure that the unit is in its most counterclockwise position, but not enough that the wheels do not turn freely. The door of the switch should remain closed until the contactor is in the Isolated position. When contactor removal is required, the door needs to be opened. Before installing the ATS contactor, the switch must be in the Bypass mode with the power through the Bypass contactor. With appropriate lifting devices, carefully insert (roll-in) the contactor into the rails of the cell as shown in Figure 31. Once all four wheels are fully inserted, the lifting mechanism can be removed as shown in Figure 32. For removal position of the contactor, the door must be opened.

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CAUTION

THE ATS (BOTTOM CONTACTOR) IS THE ONLY CONTACTOR OF THE TWO THAT CAN BE WITHDRAWN WHILE POWER IS ON WHEN THE SWITCH IS IN THE BYPASS MODE. THE BYPASS CONTACTOR DEVICE CAN ONLY BE REMOVED WHEN THERE IS NO POWER ON THE S1 OR S2 SOURCES.

CAUTION

IT IS IMPORTANT TO TAKE GREAT CARE WHEN PLACING A DRAW-OUT CONTACTOR DEVICE INTO THE INTERNAL RAILS. IF THE DEVICE IS NOT PROPERLY SEATED INTO THE RAILS, IT COULD FALL OUT FROM THE RAILS CAUSING EQUIPMENT DAMAGE AND/OR BODILY INJURY.

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6.2 To RACK-IN ATS Contactor

**CAUTION**

IT IS IMPORTANT TO TAKE GREAT CARE WHEN PLACING A DRAW-OUT SWITCHING DEVICE INTO OR OUT OF THE ASSEMBLY. WHEN REMOVING THE CONTACTOR, THE STABS THAT CONTAIN THE S1, S2, AND LOAD POWER ARE ACCESSIBLE IN THE REAR OF THE CELL AND MAY BE ENERGIZED. GREAT CARE SHOULD BE TAKEN TO AVOID CONTACT AS AN ARC FLASH AND A SHOCK HAZARD EXISTS. FAILURE TO FOLLOW THIS WARNING COULD LEAD TO DEATH OR SERIOUS INJURY. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

Close and latch bottom ATS door. The Bypass top door is already closed and latched. Using a 3/8-inch square drive ratchet with extension, which is not provided, insert into the latch hole through door and turn clockwise. If the latch door is not opened, turn the kirk-key, clockwise to open latch opening. When the unit is switched to Bypass mode, the key is now retainable for one (1) minute. If the key is not removed within one(1) minute, simply go back to Auto and then slowly back to the Bypass mode. Continue levering the contactor into its different positions using a clockwise ratcheting motion (Figure 33). The “ATS Isolated” light will go off as shown in Figure 34. These lights are also on the top door and are redundant. Continue until the “ATS Locked” light comes on. The unit is now fully isolated. The unit is still connected (secondary connector) to the control for testing but not connected to the S1 or S2 source power. The unit can now be tested, see Section 5 “Test-Manual Switch Operation.”

![Figure 33. Levering the Contactor into its Different Positions Using a Clockwise Ratcheting Motion.](image)

6.3 To DRAW-OUT ATS Contactor (Isolate)

**CAUTION**

TO DRAW-OUT, THE CONTACTOR DEVICE MUST BE IN THE TRIPPED (OPEN) POSITION. THE UNIT MUST BE IN THE BYPASS MODE WITH THE POWER THROUGH THE BYPASS CONTACTOR, AND ALL DOORS CLOSED AND LATCHED.

Place the switch in its Bypass position (see Section 5 -“Operation of the Bypass Isolation Switch”). After confirming that the "Transfer to Bypass" light is on, turn the kirk-key clockwise, to open the latch. When the unit is switched to Bypass mode, the key is now movable (clockwise to 3:00) for one (1) minute. If the key is not moved within one (1) minute, simply go back to Auto and then slowly back to the Bypass mode. Using a 3/8-in. square drive and ratchet with extension, which is not provided, insert the extension into latch hole through door and turn counter clockwise (see Figure 34) and then stop. Continue levering the contactor into its different positions using a counterclockwise ratcheting motion. The “ATS Locked” light will go off. Continue until the “ATS Isolated” light comes on (see Figure 34). The unit is now fully isolated. The unit is still connected (secondary connector) to the control for testing but not connected to the S1 or S2 source power. The unit can now be tested, see Section 5 “Test-Manual Switch Operation.”

![Figure 34. Rack-in Lights.](image)

If levering continues, the unit will be removed from the secondary connector and ready for removal when the levering reaches a hard stop. When the contactor is removed from the secondary contactor, the “ATS Isolated” light will start to flash.

**CAUTION**

WHEN THE UNIT HAS REACHED IT’S DISCONNECT POSITION, IT IS READY TO BE REMOVED. THE UNIT IS ON WHEELS AND PULLING THE UNIT OUT WITHOUT THE CORRECT LIFT COULD RESULT IN SERIOUS INJURY OR DAMAGE TO THE UNIT. THE CONTACTOR IS NOT SECURED IN THIS STATE AND REPRESENTS A FALLING HAZARD WITHOUT THE APPROPRIATE LIFT PLATFORM.
Do not exceed 25 ft lb (33.9 Nm) of torque or the levering mechanism may be damaged. There will be a hard stop when disconnected, do not turn the ratchet any more. Since the Kirk-Key has enabled the latch to be open, the door can now be opened with the ATS unit isolated. If contactor removal is required, open the door and use an appropriate lifting device, carefully pull out (roll-out) the contactor from the rails of the cell as shown in Figure 35.

Figure 35. Contactor Rolled Out from the Rails of the Cell.

Figures 36 through 38 shows the sticker near the rail for a manual reference when racking the contactor in or out. The ATS has the door closed for racking-in or drawn-out so the reference is not visible, it is just a reference.

The "Connect" area of the sticker is where the contactor is Locked In. The green light (ATS Locked In light) will illuminate on the top and bottom door. The "Test" area of the sticker is where the contactor is removed from the stabs (S1 or S2 and load) but the secondary or control connector is still connected. The ATS Isolated light will be illuminated. The "Disconnect" area of the sticker is where the secondary connector is not connected and the unit is ready to be removed from the cell. After isolation, the door is now opened for further rackout or removal. The ATS Isolated light will be flashing. The lights should be used instead of the sticker. As mentioned the sticker is not visible as the door is closed.

**WARNING**

IT IS IMPORTANT TO TAKE GREAT CARE WHEN PLACING A DRAW-OUT SWITCHING DEVICE INTO OR OUT OF THE SWITCH. WHEN REMOVING THE CONTACTOR, THE STABS THAT CONTAIN THE S1, S2, AND LOAD POWER ARE REACHABLE IN THE REAR OF THE CELL. TOUCHING THE STABS WITH ANYTHING CAN CAUSE BODILY INJURY OR DEATH.

**CAUTION**

IT IS IMPORTANT TO TAKE GREAT CARE WHEN REMOVING A DRAW-OUT CONTACTOR DEVICE. IF THE DEVICE IS NOT PROPERLY SEATED ON THE APPROPRIATE LIFTING DEVICE, IT COULD FALL CAUSING EQUIPMENT DAMAGE AND/OR BODILY INJURY.
6.4 Removal of Bypass Contactor

**CAUTION**

THE ATS (BOTTOM CONTACTOR) IS THE ONLY CONTACTOR OF THE TWO THAT CAN BE WITHDRAWN WHILE POWER IS ON WHEN THE SWITCH IS IN THE BYPASS MODE. THE BYPASS CONTACTOR DEVICE CAN ONLY BE REMOVED WHEN THERE IS NO POWER ON THE S1 OR S2 SOURCES.

To remove the Bypass contactor, all power to the unit (S1 and S2) must be removed. Unlike the ATS unit, the Bypass has no lights, or latch features so power MUST be removed. The two contactors are the same except the Bypass could be fixed and not mounted with a truck. If the Bypass is a draw-out, one should still not remove it with power on the system. The Bypass contactor can operate as a open switch and there is not a need to place it into the ATS cell to run in the automatic mode. If it is a closed transition switch, and the ATS contactor is removed, then the setpoint of the controller should be set to off (closed transition). The switch is now an open transition in-phase, TDN, or Load Voltage Decay, depending on user choice.

Note: The 1600 Amp Bypass Contactor is always a draw-out type. The 1200 Amp and below are either Fixed or Draw-out Types.

6.4.1 The Bypass Switching Device

The Bypass Contractor is a fixed type component. All power must be removed before removing or inserting a Bypass contactor. Consult the factory to replace the Fixed Bypass contactor (see Figure 40).

After power is removed, insert a tool into the bottom door and pull up to release the door lever as shown in Figure 39. Turn the door latch to open the bottom ATS door. After the bottom door is opened, the top Bypass door can now be opened.

**WARNING**

TO RACK-IN, THE BYPASS CONTACTOR DEVICE MUST BE IN THE TRIPPED (OPEN) POSITION AND ALL POWER REMOVED FROM S1 AND S2. FAILURE TO FOLLOW THIS WARNING COULD LEAD TO DEATH OR SEVERE INJURY. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON EQUIPMENT BEFORE INSERTING CONTACTORS. DO NOT ATTEMPT TO INSTALL CONTACTORS OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

**CAUTION**

IT IS IMPORTANT TO TAKE GREAT CARE WHEN REMOVING A FIXED BYPASS CONTACTOR DEVICE. IF THE DEVICE IS NOT PROPERLY SEATED ON THE APPROPRIATE LIFTING DEVICE, IT COULD FALL CAUSING EQUIPMENT DAMAGE AND/OR BODILY INJURY.
Section 7: Testing and Problem Solving

7.1 Operation

Many times the door is not closed and latched. The door light is flashing. The door must be closed and latched to operate in the following modes. The Kirk-Key must also be in the door and the key turned fully counterclockwise (9:00) (wrench latch closed on bottom door) for the unit to “start up” in the AUTO position. Some items to be accomplished are as follows:

1. Automatic mode using the ATS Contactor.
2. To perform the Bypass operation (Auto to Bypass).
3. To perform the Auto operation from Bypass (Bypass to Auto).
4. The Kirk-Key will not be released unless the unit is in Bypass and the doors are closed and latched. The unit must be in Bypass which means that the amber “Transfer to Bypass” light is on. The Kirk-Key will release and the light will come on when the ATS is tripped and the Bypass contactor is close on source 1 or 2.
5. To manually change the Bypass sources with the “Manual Bypass Switch” and the “Manual Source Select Switch.”
6. The Kirk-Key must be turned counterclockwise in the lock after closing the draw-out opening or the unit will not go back to the ATS mode. The key of the Kirk-Key can be removed in this position (counter clockwise with latch closed) if desired. The lamps will all flash if this in not completed and one tries to return to the Auto mode.
7. The lamps outside of the ATC-900 will not be on in the normal ATS mode. They will be used only when the unit is transferred to Bypass.
8. If the ATS is isolated or removed and the switch is a closed transition type, then the controller should be set to an open transition type until the ATS is reinserted. The Door and Latch is an extra safety feature of the Bypass Isolation Switch. The ATS bottom door is only opened when the ATS contactor has been drawn-out and is ready to be tested, removed, or installed. The Bypass top door never needs to be opened unless power is removed from S1 and S2. See Section 6.4 for directions on how to open the door without power. Turning the “Test-Manual” switch to the “Manual Bypass” position and back to “Off” will also reset the Controller (ATC-300 + or ATC-900). This reset function allows the controller to be reset with the doors closed.

7.1.1 Closed Transition Connections

For Closed Transition, if that option is ordered, the unit will arrive from the factory with the Closed Transition provided. There is the ability to make the unit into an open transition if desired by simply changing the setpoint to “off” for closed transition and then picking In-Phase, TDN, or LVD in the same menu area. If the ATS is isolated or racked out, then the closed transition setting should be disabled until the ATS is racked back in. The Bypass will still be an automatic (patented) switch but not for closed transition (only for open transition) until the ATS is racked back in.

7.2 Lights

Simple light tests can be performed on the ATS controller by pushing in the lamp test push button. All other lamps can be tested using the lamp test push button switch on the option panel. All lamps should light when the Lamp Test switch is pushed. The “Locked In” and “Auto” lamps will stay on for approximately 20 seconds after the switch is released. This is normal operation. When the unit is in the ATS position all lamps will be off except for those on the ATC-300 + or 900. When switching to ATS from Bypass, the ATS LOCKED IN lights will remain on for about 20 seconds. Pushing the lamp test on the switch and having the lamps all light is a very good sign that the logic panel is operating correctly. If the Locked In green lamp flashes when all the other lamps are on, check the contactors as one or both are not fully racked in.

7.2.1 Logic Controller Update & PLC non-battery

The Logic Controller no longer has a battery in it to keep its program active. After September of 2014, a PLC with active flash memory was installed in all switches. All switches with ATC-900 controllers have the flash type Logic Controllers. If there is an ATC-800 to ATC-900 upgrade (with an easy field installable kit), then there will also be a Logic Controller supplied as part of the kit.

7.3 Testing

After the ATS equipment is initially installed or during planned outages, the installation should be tested to ensure that all equipment operates properly. This attention to detail will help avoid unexpected malfunctions. Mechanical and/or electrical tests should be performed as described in this section.

The frequency of subsequent testing should be based on recommendations of the Genset manufacturer. Many times the frequency is not in the window of the Controller set-point causing the unit not to switch to S2. Make sure the generator is supplying the correct voltage and frequency to the switch. Make sure that the setpoints in the controller are correct for the voltage applied. If the available LED is not on the controller’s MIMIC bus, then check the setpoints.

**WARNING**

HIGH VOLTAGE ASSOCIATED WITH OPERATIONAL TRANSFER SWITCH EQUIPMENT PRESENT A SHOCK HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

IN ADDITION, IMPROPER OPERATION OF THE GENERATOR SET PRESENTS A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. OBSERVE ALL SAFETY PRECAUTIONS IN YOUR GENERATOR SET OPERATIONS AND INSTALLATION MANUALS.

7.3.1 Mechanical and/or Electrical Testing

**NOTICE**

SINCE FEATURE 4 (TIME DELAY ENGINE COOL-OFF) IS A STANDARD FEATURE, AN ENGINE START SIGNAL WILL BE PRESENT FOR A PERIOD OF TIME WHEN THE SWITCH IS FIRST ENERGIZED. THE PERIOD OF TIME IS EQUAL TO THE TIMER SETTING. TO AVOID STARTING THE ENGINE DURING THIS TIME PERIOD, TURN THE GENERATOR CONTROLS TO THE OFF POSITION.

Before energizing the ATS equipment, insure that all safety precautions are taken and that all WARNINGS and CAUTIONS are observed.

7.3.2 No Voltage Steps

With no voltage available on either power source, proceed as follows.

Step 1: The generator engine start controls should be in the OFF position to prevent an undesired start.

Step 2: Ensure that the ATS has been set to the proper applied system voltage (See Section 3.3).

Step 3: Check all ATS loads to ensure that they are ready to be energized. Re-check the cables for the correct phases, neutral, and grounds.

7.3.3 Connecting the Power Sources

Step 1: Close the Source 1 power source upstream protection device.

Step 2: Connect the engine start battery cable.

Step 3: With the emergency generator in the OFF position, close the Source 2 power source upstream protective device, assuming such a device used.

7.3.4 Operational Checks

Step 1: Check to ensure that Source 1 switching device is in the CLOSED position.

Step 2: Initiate an automatic transfer operation from the Source 1 to the Source 2 power source by pressing the <Engine Test> pushbutton two times.

Note: The Controller provides the capability to set the Engine Test function to:

0. No Load Engine Test;
1. Load Engine Test; or
2. Disabled.

The factory default is set to:

1. Load Engine Test
   a. After the Time Delay Engine Starting (TDES) has timed out, the engine should start, run, and build up to normal voltage and frequency.
   b. The transfer switch will transfer to the Source 2 power source after the Time Delay Normal to Emergency (TDNE) times out.

Step 3: Initiate an automatic transfer operation back to the Source 1 power source by pressing the <Engine Test> pushbutton one time.

1. After the Time Delay Emergency to Normal timer (TDEN) has timed out, the transfer switch will transfer back to the Source 1 power source.
2. The Time Delay for Engine Cool-Off (TDEC - Feature 4) will allow the engine to run unloaded for a preset time after transfer to the Source 1 power source is completed.

7.3.5 Alternate Tests

1. Alternate operational tests may be possible depending upon the options provided with any given ATS. Refer to the schematic diagram provided with the ATS equipment, along with the specification nameplate, to determine the exact options provided.

2. After the controller is set-up and switching from S1 to S2, etc, in a quick start-up, going from the ATS to Bypass and back, with S1 and then S2, will check 90% of the bypass area of the switch. ATS isolation and manual operation will fill the testing.

NOTICE

AT THIS POINT, AND PRIOR TO MAKING ANY ATTEMPT TO ENERGIZE THE ATS EQUIPMENT, THE ENGINE-DRIVEN GENERATOR SHOULD BE OPERATED. IF NECESSARY, THE VOLTAGE REGULATOR ON THE GENERATOR SHOULD BE ADJUSTED ACCORDING TO THE MANUFACTURER’S RECOMMENDATIONS. THE ATS EQUIPMENT WILL RESPOND ONLY TO THE RATED VOLTAGE AND FREQUENCY PROGRAMMED INTO THE CONTROLLER.

Step 4: Close any generator engine-start controls opened as a result of actions taken in Step 1, the switch.

Step 5: Where required, use an accurate voltmeter to check phase-to-phase and phase-to-neutral voltages present at the transfer switch Source 1, Source 2, and/or load terminals.

WARNING

DO NOT ATTEMPT TO MANUALLY OPERATE THE SWITCH WITH THE SOURCE 1 POWER SOURCE CONNECTED AND AVAILABLE. DO NOT ATTEMPT TO MANUALLY OPERATE THE SWITCH WITH THE SOURCE 2 POWER SOURCE CONNECTED AND AVAILABLE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN DEATH OR SEVERE INJURY. MOVE CONTACTORS TO “TEST” POSITION AND ENSURE NO VOLTAGE IS ON EQUIPMENT PRIOR TO OPERATING MANUALLY. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

Eaton Care for assistance
877-386-2273 option 2, option 4, and then option 3

KIRK-KEY Replacement or Copy
“kirkkey.com”
800-438-2442

Obtain a Duplicate Key Form

For more information visit: www.eaton.com
7.4 Problem Solving

A basic problem-solving effort is the first step to take prior to calling for assistance. Frequently, the effort will successfully address most problems encountered. The problem solving procedure is presented in the Troubleshooting Guide. Remember, only qualified individuals familiar with the ATS equipment and the system in which it is applied should attempt these problem solving procedures.

If a problem persists after having completed the problem solving procedure, contact an Eaton representative for further assistance. When calling for assistance, the following is the minimum information required to properly address the need:

1. Style number of ATS, GO: #
2. Catalog number of ATS;
3. Actual location of the ATS (type of facility, address, etc.);
4. Company name and name and position of individual representing company;
5. Basic description of the situation as it exists; and
6. Any results of the problem solving steps taken and/or readings taken.

Section 8: Adjustments

8.1 General

Refer to I.B. 01602009E, supplied with the ATS for ATC-300+ Controller adjustments and programming.

Refer to the IB140012EN, supplied with the ATS for ATC-900 Controller. There is no adjustments required within the switch unit.

8.2 Standard Options and Options Adjustments and Settings (Parallel Limit Timer & Relays)

1. Closed Transition Switches: There is a Parallel Limit Timer (watchdog timer) included from National Contacts Corp. It is red and has an adjustment on it from .05 to 1 second. Closed Transition must be completed within 100ms per code so the timer should be set to around 11:00 or per customer requirements. Anything at 100ms or higher. There is a terminal block provided “TBWD” for user interface. It is a NO contact.

2. With ATC-900 controllers, the PC&S relays for S1 and S2 Phase reversal, phase sequence, and Unbalanced/Loss, are not used as the ATC-900 has those functions integrated. The setpoints for these functions should be adjusted for the application. Experience has shown that minimum settings should not be used.
Section 9: Maintenance

9.1 Introduction

**WARNING**

HIGH VOLTAGE ARE PRESENT IN AND AROUND ATS EQUIPMENT. BEFORE INSPECTING OR MAINTAINING THIS EQUIPMENT, DISCONNECT THE LINE POWER FROM, THEN LOCK OUT, IF POSSIBLE, THE UPSTREAM DISCONNECT DEVICE. FAILURE TO FOLLOW THIS PROCEDURE COULD CAUSE SEVERE PERSONAL INJURY AND/OR DEATH. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON THE EQUIPMENT PRIOR TO INSPECTING OR SERVICING. WHILE ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING OR OPERATING EQUIPMENT.

In general, ATS switch 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 the equipment’s surroundings. If a significant amount of dust or foreign matter is present, a more frequent maintenance schedule should be followed.

Remember, if the ATS contactor is removed for any reason, the switch will automatically use the Bypass contactor so there is no reason to put the Bypass contactor in the ATS cell. The switch will still run automatically. If the ATS is removed and the switch is a closed transition type, simply place the switch in the Open Transition Mode. It is suggested that visual inspections of the equipment be made on a regular basis, not just during 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.

9.1.1 Logic Controller Battery

The Logic Controller no longer has a battery in it to keep its program active. After September of 2014, a PLC with active flash memory was installed in all switches. All switches with ATC-900 controllers have the flash type Logic Controllers. If there is an ATC-800 to ATC-900 upgrade (with an easy field installable kit), then there will also be a Logic Controller supplied as part of the kit.

9.2 Procedures

A suggested maintenance procedure is outlined in Table 5.

9.3 Removal of Enclosure Covers

If required to remove the enclosure covers a 3/8 socket will be required. The back and two sides are similar in that if the lower panels need to be removed, the top panel must be removed first.

**WARNING**

IT IS IMPORTANT THAT THE SAME BOLTS BE USED FOR THE REAR PANELS AS THEY ARE SHORTER THEN THE SIDES AND FRONT.

In order to remove the front panels, top and lower, the two doors must be opened on the unit. Open the bottom door first by inserting a tool in the hole, pulling up and turning the lever (Figure 39).
Table 5. Periodic Maintenance Procedures.

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.</strong> Make the ATS equipment safe for inspection and/or maintenance.</td>
<td>Disconnect the line power from the equipment being serviced by opening the next highest disconnect device. Make certain that any accessory control power is switched off by disconnecting all control plugs.</td>
</tr>
<tr>
<td><strong>B.</strong> Inspect the structure area for safety hazards or potential maintenance problems.</td>
<td>Inspect the area, especially where the switching device is installed, for any safety hazards, including personnel safety and fire hazards. Exposure to certain chemical vapors can cause deterioration of 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 conductor insulation, or as pitting or melting of the conductor surfaces due to arcing. Inspect the secondary control connections for damage and the control wiring for insulation integrity.</td>
</tr>
<tr>
<td><strong>C.</strong> Inspect the power contactor for dust, dirt, soot, grease, moisture, or corrosion.</td>
<td>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 power contactor. If contamination is found, look for the source and fix the problem.</td>
</tr>
<tr>
<td><strong>D.</strong> Check for material integrity, uneven wear, discoloration, or loose hardware.</td>
<td>Severe material cracking will require replacement and loose hardware will need to be tightened.</td>
</tr>
<tr>
<td><strong>E.</strong> Check the terminals and connectors for looseness or signs of overheating.</td>
<td>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.</td>
</tr>
<tr>
<td><strong>F.</strong> Contact Inspection Procedure</td>
<td>Remove all the screws on the molded cover over the power assembly. Inspect the contacts. Contact Eaton Care (1-877-ETN-CARE, Option 2) if the contacts have excessive wear. Reinstate the molded cover and tighten screws to 17 in-lbs.</td>
</tr>
<tr>
<td><strong>G.</strong> Exercise the power contactor if it is not often exercised while in operation. This will permit a &quot;wiping&quot; action by the contacts.</td>
<td>If the power contactor is used for frequent switching during normal operation, this step can be disregarded.</td>
</tr>
<tr>
<td><strong>H.</strong> Return the ATS equipment to service.</td>
<td>Make certain all barriers are in place and the doors closed and latched. Reapply the secondary and primary power.</td>
</tr>
<tr>
<td><strong>I.</strong> Logic Controller Battery Inspection/Replacement</td>
<td>Logic Controllers (LC) supplied with Automatic Transfer Switches (ATS) manufactured prior to September of 2014 were designed with a non-rechargeable battery. The function of the battery is to keep the stored program active in the LC memory. The LC battery has a 7-10 year life in service. However, the battery lifespan is directly affected by how long an ATS is not in service (i.e., no power applied) before commissioning. With no power applied to the ATS, the battery has a 1 year life from the date that the program was uploaded to the LC. Battery life can also be affected by ambient conditions such as temperature and humidity. Routine Maintenance/Replacement for LC Battery: Battery should be replaced every 2-3 years. Instruction Literature IL140004EN is available for battery replacement directions. Due to normal product evolution, a flash-based Logic Controller without a battery is now available. If it is desired to eliminate this point of maintenance, the LC can be directly replaced with a new style of battery-less LC. No additional wiring is required.</td>
</tr>
</tbody>
</table>
Section 10: Renewal Parts Guide

10.1 General

Refer to Figure 41 for assistance with selecting and ordering selected ATS renewal parts.

Replacement Parts List

Replacement parts can vary depending on the specifications of the unit ordered and should be based on the ACTUAL General Order Number / Catalog Number and/or Manufacturing Information generated from the Bidmanager file. This list represents some of the most common replacement parts available.

<table>
<thead>
<tr>
<th>FUNCTION / DEVICE</th>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRANSFORMER ASSEMBLY</td>
<td>Call Factory</td>
<td>1</td>
<td>D-FRM XFMR BOX ASSY</td>
</tr>
<tr>
<td>TRUCK AND CONTACTOR</td>
<td>Call Factory</td>
<td>2</td>
<td>3P BYPASS ISO CONTACTOR TRUCK</td>
</tr>
<tr>
<td></td>
<td>Call Factory</td>
<td>2</td>
<td>4P BYPASS ISO CONTACTOR TRUCK</td>
</tr>
<tr>
<td>WIRE HARNESS ASSEMBLIES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>BYPASS ISOL DOOR HARNESS ATC 900</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>RELAY CONTROL PANEL HARNESS</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>LOGIC CONTROLS HARNESS ASSY</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>CONTACTOR 1 ATS</td>
</tr>
<tr>
<td>D AND O</td>
<td>Call Factory</td>
<td>1</td>
<td>CONTACTOR 2 BYPASS</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>CONTACTOR 1 (ATS) - INTER CONN</td>
</tr>
<tr>
<td>D AND O</td>
<td>Call Factory</td>
<td>1</td>
<td>CONTACTOR 2 (BYPASS) - INTER C</td>
</tr>
<tr>
<td>D AND O</td>
<td>Call Factory</td>
<td>1</td>
<td>BYPASS MAIN INTER CONN ATC 900</td>
</tr>
<tr>
<td>D AND O</td>
<td>Call Factory</td>
<td>1</td>
<td>LIMIT SWITCH AND INDICATION</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>ATS DOOR HARNESS ASSEMBLY</td>
</tr>
</tbody>
</table>

For more information visit: www.eaton.com
### Replacement Parts List (Continued)

<table>
<thead>
<tr>
<th>FUNCTION / DEVICE</th>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>BYPASS DOOR HARNESS ASSY ATC 300+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D AND O</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>CONTACTOR 2 Bypass</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>CONTACTOR 2 (BYPASS) - INTER C</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>LIMIT SWITCH/INDICATION</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>BYPASS MAN INTER CONN ATC 900</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>BYPASS MAN INTER CONN ATC 300+</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>XFMR EXTENSION HARNESS FIXED TOP ENTRY</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>OPTION 156 AND 19H CONT. 1 (ATS)</td>
</tr>
<tr>
<td>D AND O</td>
<td>Call Factory</td>
<td>1</td>
<td>OPTION 156 AND 19H CONT. 2 (BP)</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>OPTION 156 AND 19H TERMINAL BLOCKS</td>
</tr>
<tr>
<td>D AND O</td>
<td>Call Factory</td>
<td>1</td>
<td>OPTION 47H PARALLEL LIMIT TIMERS</td>
</tr>
<tr>
<td>FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>OPTION 57H BYPASS ISOLATION</td>
</tr>
<tr>
<td>D AND O - FIXED</td>
<td>Call Factory</td>
<td>1</td>
<td>OPTION 61B UPS TERMINAL BLOCKS</td>
</tr>
</tbody>
</table>

### Controller

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6D 22360642A</td>
<td>1</td>
<td>ATC 300+ CONTROLLER CONTROLLER, 3 POSITION</td>
</tr>
<tr>
<td>8160A 906 01</td>
<td>1</td>
<td>ATC 900 CONTROLLER CONTROLLER BYPASS, Open Transition</td>
</tr>
<tr>
<td>8160A 906 25</td>
<td>1</td>
<td>ATC 900 CONTROLLER CONTROLLER BYPASS, Closed Transition</td>
</tr>
</tbody>
</table>

### Control Relays

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>67A 2579613</td>
<td>2</td>
<td>RELAY ASSEMBLY, 3 POLE, 120VAC</td>
</tr>
<tr>
<td>D 9PR 10BA</td>
<td>1</td>
<td>DPST D POWER RELAY, 120VAC, 2</td>
</tr>
<tr>
<td>D 9PR 8BA</td>
<td>6</td>
<td>4PST NO POWER RELAY 120VAC</td>
</tr>
</tbody>
</table>

### Line Replaceable Units

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6D 80206 01</td>
<td>1</td>
<td>ATS BYPASS ISOLATION DOOR ASSY - ATC 900</td>
</tr>
<tr>
<td>6D 80206 02</td>
<td>1</td>
<td>ATS BYPASS ISOLATION DOOR ASSY - ATC 300+</td>
</tr>
<tr>
<td>6D 80216 01</td>
<td>1</td>
<td>ATS BYPASS ISOLATION RELAY PNL</td>
</tr>
<tr>
<td>6D 80426 01</td>
<td>1</td>
<td>ATS BYPASS ISOLATION LOGIC (Flash type, no battery)</td>
</tr>
<tr>
<td>6D 80234 01</td>
<td>1</td>
<td>BYPASS ISOLATION OPTION PNL</td>
</tr>
<tr>
<td>6D 80234 02</td>
<td>1</td>
<td>BYPASS ISOLATION OPTION PNL ASSY FIXED</td>
</tr>
<tr>
<td>68C 8250H11</td>
<td>1</td>
<td>OPTION TRAY</td>
</tr>
<tr>
<td>6D 80234 01</td>
<td>1</td>
<td>3P BYPASS ISO FINAL ASSY ATC 900</td>
</tr>
<tr>
<td>6D 80246 02</td>
<td>1</td>
<td>3P BYPASS ISO FINAL ASSY ATC 300</td>
</tr>
<tr>
<td>6D 80234 05</td>
<td>1</td>
<td>3P FIXED MOUNT BYPASS FINAL ASSY HARNESS ATC 900</td>
</tr>
<tr>
<td>6D 80234 06</td>
<td>1</td>
<td>3P FIXED MOUNT BYPASS FINAL ASSY HARNESS ATC 300</td>
</tr>
<tr>
<td>68C 83016 53</td>
<td>1</td>
<td>BYPASS XFMR BOX ASSY (HARNESS 690.277V 60HZ</td>
</tr>
<tr>
<td>68C 29880 02</td>
<td>1</td>
<td>3P 480V FIXED MNT CONT ASSY</td>
</tr>
</tbody>
</table>

### Enclosure Door (Upper and ATS)

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6D 80256 01</td>
<td>1</td>
<td>BYPASS ISOLATION LWR DOOR ASSY</td>
</tr>
</tbody>
</table>
### Replacement Parts List (Continued)

<table>
<thead>
<tr>
<th>FUNCTION / DEVICE</th>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMPONENTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>2</td>
<td>3 POSITION SWITCH, SELECTOR</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>C-H 10250T CONTACT BLOCK, 2NC</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>2 POSITION SWITCH, SELECTOR</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>3</td>
<td>2N.O CONTACT BLOCK</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>SWITCH; E34 PUSHBUTTON, BLACK</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>1 N.O CONTACT BLOCK</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>3</td>
<td>RED LIGHT</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>7</td>
<td>GREEN LIGHT</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>4</td>
<td>AMBER LIGHT</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>WHITE LIGHT</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>5</td>
<td>D-FRAME MICRO SWITCH</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>LIMIT SWITCH</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>D-FRAME HANDLE</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>MICRO SWITCH</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>9B, 2POS SELECTOR SWITCH</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>9B, 1NO 1NC CONTACT BLOCK</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>9B, 120VAC LIGHT</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>9B, LIGHT COVER WHITE</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>48D, POWER XPERT GATEWAY (PX 6400)</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>48D, ACCESSORY KIT POWER XPERT</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>48D, 48 WATT 2AMP POWER SUPPLY</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>1</td>
<td>48D, 100 OHM, 1/4 WATT RESISTOR</td>
<td></td>
</tr>
<tr>
<td>Call Factory</td>
<td>2</td>
<td>2SH/2BL, 3PH/3L PHASE REV, LOSS VOLTAGE UNBAL. RELAY</td>
<td></td>
</tr>
<tr>
<td><strong>OPTIONAL FEATURES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORMAL SOURCE AVAILABLE</td>
<td>Call Factory</td>
<td>OPT 14G SOURCE 1 RELAY AT_3</td>
<td></td>
</tr>
<tr>
<td>EMERGENCY SOURCE AVAILABLE</td>
<td>Call Factory</td>
<td>OPT 14H SOURCE 2 RELAY AT_3</td>
<td></td>
</tr>
</tbody>
</table>

For more information visit: [www.eaton.com](http://www.eaton.com)
Section 11: ATS Quick Start Instructions

**WARNING**

THESE QUICK START INSTRUCTIONS ARE NOT A COMPLETE SOURCE OF INFORMATION ON THE ATC-300+ CONTROLLED ATS EQUIPMENT. INSTALLATION SHOULD NOT BE STARTED UNTIL THE ENTIRE INSTRUCTION BOOK HAS BEEN REVIEWED AND UNDERSTOOD. FAILURE TO FOLLOW THE FULL INSTRUCTIONS CAN RESULT IN DEATH, SEVERE PERSONAL INJURY, OR PROPERTY DAMAGE.

**WARNING**

THESE QUICK START INSTRUCTIONS ARE PROVIDED FOR USE ONLY BY TECHNICIANS HIGHLY FAMILIAR AND EXPERIENCED WITH ATC-300+ CONTROLLED ATS EQUIPMENT INSTALLATION, SET UP, AND TESTING. IT IS STRONGLY SUGGESTED THAT THE FULL INSTRUCTIONS BE FOLLOWED FOR ALL INSTALLATIONS, SET UP, AND TESTING.

---

**Step 1:** Mount the ATS on a flat rigid surface. Shim if necessary.

**Step 2:** Install the power cables. Cables must be sized and installed per National Electrical Code, refer to NFPA70. The cables must be sized within the specified cable size range on the side of the cable connectors.

Connect the cables (A, B, C, N, G) and torque to the correct value (For type AB-750-4 terminal lugs, the torque value is 550 in/lbs) indicated on the label on the door in the following order:

1. Load Cables* (T1, T2, T3);
2. Source 1 or Utility Supply (N1, N2, N3); and
3. Source 2 or Generator Supply (E1, E2, E3).

For 4 pole transfer switches, connect the load cables (TN), Source 1 or utility supply (NN), and Source 2 or generator supply (EN). Refer to Figure 42 for the location of all parts discussed in this document. Figure 17a also shows the bus configurations for a three pole system.

---

**Figure 42. Typical Fixed ATC-300+ Controlled 1200A ATS.**
Step 3: Turn the generator OFF at the generator control panel. This will prevent unexpected activation of the generator.

Step 4: Connect the Engine Generator Start wires to red terminal blocks TB-1 and TB2-2. (See Section 4.5.1 and Figure 21) This contact is CLOSED whenever the engine generator is needed, and should be connected to a generator controller. NEVER connect directly to a starter solenoid or ignition system. See the Genset manufacturer instruction leaflet for recommended wire sizes and location procedures.

Step 5: Make sure the Doors are both closed and latched and the Kirk-Key is in the key hole and locked. Using the ATC-900 as an example, apply Utility (Source 1) power. If the switch is properly applied for the system voltage ordered, the display should work and the Source 1 Available LED should light. Using a voltmeter, check for proper system voltage on Source 1 and load terminals. Check all phases on a 3-phase switch. Voltage measurements should be taken phase to phase and phase to neutral.

Step 6: To view the setpoints, press the view setpoints on the button switch below the display menu. To change the setpoints setpoints push the button under that menu and put in the password, default 0900 (0300 for the ATC-300). This is an example. Please use the Controller Instruction Booklet for more detailed instructions and setpoint information.

After entering the password for the ATC-900, press the < Step/Enter> pushbutton until the VIEW SETPOINTS menu appears. Select YES. Press the < Step/Enter> pushbutton to scroll through the setpoints.

The ATC-900 is similar to the ATC-300 but the 900 has many more features. Do not turn power off the unit when either controller is being programmed for the change in set-points. Please use the Controller Instruction Booklet for more detailed instructions and setpoint information. See section 7.1 for some troubleshooting items.
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