**O & M Manual for up to 400 amps (600 Vac Max)**  
ATC-300+/ATC-900 Contactor Open/Closed Transition Fixed and Dual Drawout Bypass Isolation Automatic Transfer Switch

**Instruction Booklet**

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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-900 controlled contactor based transfer switch equipment with ratings from usually 100 through 400 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. 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.

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**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.**

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**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.**

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1.2 General Information

Transfer switches are used to protect critical electrical loads against loss of power. The Source 1 power source of the load is backed-up by a Source 2 power source. A transfer switch is connected to both the Source 1 and Source 2 power sources and supplies the load with power from one of these two sources. In the event that power is lost from the Source 1 power source, the transfer switch transfers the load to the Source 2 power source. This open transition transfer can be automatic or manual, depending upon the type of transfer switch equipment being used. Once Source 1 power is restored, the load is automatically or manually transferred back to the Source 1 power source, again depending upon the type of transfer equipment being used (Figure 2).

In addition, the closed transition feature may be applied where it is desirable to avoid any momentary power interruptions. Although the closed transition switch is not a substitute for an uninterruptable power source (UPS), it does eliminate power interruptions to loads except to those caused by power sources or equipment external to the transfer switch. If both sources are acceptable as determined by the ATC-900 controller. A make-before-break transfer is performed during a transfer test or retransfer operation using the bypass contactor momentarily.

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**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 and the Dual Drawout Switch both shown in Figure 3 are 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 with the dual draw-out type switch.

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 a switch although only as an open ATS not a closed ATS.
Figure 4. Typical Bypass Isolation Switch Schematic Dual Drawout Shown.

Table 1. Fixed 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>30,000</td>
<td>50,000</td>
<td>22,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Specific Breaker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At a Test Voltage of 240V the Any Breaker is 35kA
Fuse test at 600V @ 200kA
Tested in accordance with UL1008.
Eaton transfer switch will coordinate with a power switching device short time rating. Contact factory for details.
See specific breaker listing for all current breakers listed per rev.7 of UL1008 specification.
1.3 Draw-out Switching Devices

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 contractor could be fixed with no slides enabling it to be drawn out. 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 contactor switching device is mounted with safety interlocks, in a "slide" mechanism, allowing the switching device to be "drawn-out" for service, maintenance, and/or replacement. The Bypass device is either a fixed type contractor or drawout type.

1.3.2 Draw-out Switching Devices

The ATS draw-out switching device is a design having three positions with the compartment door closed (LOCKED IN, ISOLATED, REMOVED). Figure 6 shows the contactor fully disconnected from the transfer switch. 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 top of the contactor 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 removed, 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, Bypass fixed option shown on top and drawout ATS on the bottom.

Figure 6. Draw-out Switching Device Fully Extended (Removed) from the Transfer Switch’s Runbacks.
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).

```
1 to 2 3 4 5 to 6 7 8 to 9 10 11 12
BI  C  9  C3  X  3  0400  X  S  U
```

The catalog number BIC9C3X30400XSU 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 400A 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>
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<tbody>
<tr>
<td>Mechanism</td>
<td>C = 3 Position</td>
</tr>
<tr>
<td>Switch</td>
<td>E = Draw-out X = Fixed</td>
</tr>
<tr>
<td>Number of Poles</td>
<td>2 = 2 pole, 3 = 3 pole, 4 = 4 pole</td>
</tr>
<tr>
<td>Voltage</td>
<td>A = 120V, 60Hz, B = 208V, 60Hz, C = 220V, 50Hz, D = 230V, 50Hz, E = 240V, 60Hz, F = 415V, 50Hz, G = 365V, 50Hz, H = 380V, 50Hz, K = 401V, 50Hz, M = 400V, 50Hz, N = 415V, 50Hz, O = 415V, 50Hz, W = 240V, 60Hz, X = 480V, 60Hz, Z = 365V, 50Hz</td>
</tr>
<tr>
<td>Enclosure</td>
<td>S = NEMA 1, J = NEMA 12, N = NEMA 3R</td>
</tr>
<tr>
<td>Certification</td>
<td>U = UL Listed, R = UL Recognized</td>
</tr>
<tr>
<td>Logic</td>
<td>ATC-300+ D = ATC-900</td>
</tr>
<tr>
<td>Orientation</td>
<td>C = Contactor</td>
</tr>
<tr>
<td>MECHANISM</td>
<td>ATP-300+</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 60°C (-4 to 140°F). A 100 watt heater may be required for heating or condensation.
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° to 85°C (-4° 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 these main LRUs (Line Replaceable Units):

1. The power panel; consisting of the contactors;
2. The voltage selection at the transformer panel;
3. The Logic Control;
4. The relay panel;
5. The door including the ATC controller; and
6. The bus kit for a Dual Draw-out type.

The panels are interconnected via connector plugs and mounted in an enclosure (Figure 8a). The top and bottom cells are also shown in Figure 8b and 8c. There is a Top and Bottom panel above and below the contactor cells. The top panel houses the transformer, relay, and Logic Controller and these items are seldom necessary to get to. The bottom panel houses any special customer order options that may be required for their particular system. Both panels are very easy to remove as both have shoulder bolts and only two bolts that require to be removed. Front cable access is through these areas depending on the location of the cable terminals.

The customer connections such as “Engine Start” are behind the bottom ATS door and have a convenient swing out terminal blocks for very easy access.

Figure 8a. Basic Panels of the Bypass Isolation Switch (Fixed Shown)
3.2 Power Panel (Contactor with Slide)

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 “cartridge.” The actual power connections fingers 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, and high interrupting capacity. 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. 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 has several electronic interlocks in 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.

Figure 11. Manual Indicators on Contactor Mechanism.

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 for safety, with the door closed and latched for additional safety. 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 only to show the draw-out, rack-in mechanism housing.

Figure 12. Draw-out Mechanism.
3.3 Line Voltage Selection Panel

3.3.1 North American Voltage Selection (208, 240, and 480), International Voltage Selection (415, 380, 230, 220), (50-60 Hz) 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 208 to 480 Vac to satisfy any required North American market application voltage. For 120 Vac operation, usually the unit has no transformer. Ensure that the plug is inserted into the intended voltage at start-up. There is a similar selection panel for international voltages. The voltage selector plug is for line voltage.

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);
- 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.
3.5 Neutrals

All 2-pole and 3-pole transfer switches are equipped with 100% rated neutral connections. Figure 17a shows the interconnect bus configuration for the Fixed Bypass Isolation Switch. The connections for the Dual Draw-out can be in any configuration and is usually shipped with the S1 and Load on top and the S2 on 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 bus copper.
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 Device option 51S150kA is a feature that gives protection for surge current capacity rating 50kA, up to 600VAC by providing a low impedance surge path to ground while supporting rated voltage.

3.6.1.1 Standard Features

The following are a few of the popular standard features of the ATC-900 Controller. Please see the specific controller Instruction booklet for all the 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 contator. 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.

Figure 17b. Neutral and Ground Copper.
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.

6B. Phase Undervoltage and Underfrequency Protection

5C. Overvoltage/Overfrequency

5H. 26H Phase Reversal

For a 3-phase wye source, this feature monitors the phase sequence of the sources. If a source does not have the same ABC or CBA sequence as the setpoint value, that source will be considered “Unavailable”.

For a 3-phase delta source, this feature should be turned off via the PHASE REV setpoint.

5L. 26L Source 2, 3-Phase Source 2 Voltage Unbalance/Phase loss

For a 3-phase wye source, this feature monitors phase voltage ratios. Voltage unbalance (%) is calculated as the difference between the maximum and minimum phase voltage, divided by the minimum phase voltage. User-selectable setpoints are available for dropout and pickup unbalance settings (minimum 2% differential). Dropout is adjustable from 5 to 20%. Pickup is adjustable from 3 to (Dropout –2%). A setpoint for user-selectable time delay from 10 to 30 seconds is provided. The factory default setpoints are: 5% dropout, 3% pickup, and 30 seconds time delay. A user-selectable setpoint for enable and disable is also provided.

When an unbalance condition is detected on Source 2, the Unbalance Timer (TD UNBAL) starts timing. After TD UNBAL times out, Source 2 is declared “failed”.

For a 3-phase delta source, this feature should be turned off via the VOLT UNBAL setpoint. External relays are used when the ATC-900 is used if this option is picked. They would be located behind the bottom panel.

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. Bypass Timer Pushbutton

This feature provides a way (by pushing the Help and Step pushbutton simultaneously) to bypass the timers. It will reduce any or all of the programmed time delay to zero.

8C. Bypass TDEN

This feature provides a membrane pushbutton to bypass the TDEN time delay.

8D. Bypass TDNE

This feature provides a membrane pushbutton to bypass the TDNE time delay.

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 ATC-300 or the ATC-900 instruction booklet for instructions. The ATC-900 has two exercisers available.

Programmable setpoints allow for selection of three test cycles:
• Engine Start/Run Only (No Load);
• Exercise with Load Transfer; or Disabled
• This is a “Failsafe” operation.
26D. Go to Source 2

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.

32A. Time Delay Neutral

This feature provides a time delay in the neutral position during the transfer and re-transfer operations during which both Source 1 and Source 2 are disconnected from the load circuit. The time delay is programmable and is the same for both transfer and re-transfer operations.

35A. Pre-transfer Post Transfer, or Pre/Post Transfer Signal with 1 N.O. and 1 N.C. Contacts

This feature 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.

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 then the Nominal System Voltage will be fixed at 120 volts and all voltage pick-up and trip-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. There are many options using the closed transition and in-phase, see the appropriate controller instruction booklets.

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 3. Transfer Switch Equipment Enclosures.

<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>
</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. 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 (22-24Volts) 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**

SINCE THE ENCLOSED TRANSFER SWITCH MUST BE LIFTED INTO PLACE FOR MOUNTING, BE CERTAIN THAT ADEQUATE RESOURCES ARE AVAILABLE FOR LISTING TO AVOID PERSONNEL INJURIES OR EQUIPMENT DAMAGE.

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.

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IB140018EN For more information visit: www.eaton.com
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.

**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.

### 4.4 Mounting Procedure

**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.

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). 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. If the external bottom brackets are on the unit, they can be removed as they may be used for shipping as shown in Figure 19a. Front access cabling will require the removal of the front top and bottom covers and the panels. See section 3.1 for panel descriptions.

**Step 2:** Gently maneuver the switch into its location using all of the supplied lift brackets.

**Step 3:** Bolt the enclosure to the base (see Figure 19b). Use seismic washers if Seismic Uniform Building Code (UBC) Zone 4 certification is desired (Figure 19b), and secure with 1/2-13 UNC Grade 5 hex bolts.

**Step 4:** Tighten bolts to 40 ft-lbs.

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

Figure 18. Opening the Door with No Power to the Switch.

Figure 19a. Shipping Bracket

Figure 19b. Mounting using Seismic Washers.
4.5 Power Cable Connections

The outline for the fixed or draw-out type bypass switch is shown in Figure 20a and the outline for the 3R is shown in Figure 20b. The normal outline dimensions are 30.00w x 78.06h x 29.30d. Figures 20c and 20d show the connections for the Fixed and draw-out Bypass Isolation Switch. The figures show a 3-pole device. The bus is labeled inside the unit. The fixed bypass has copper connections with S1 at the top, S2 and the Load is at the bottom. The dual drawout bypass has interchangeable copper so that S1, S2, and the load terminals can be at the top, bottom, or both. These can also be changed out in the field. Instructions are available for this change out. The default for the dual draw-out is S1 and Load on the top while the S2 is on the bottom.

The neutral (Figure 20e) can be placed at the bottom or the top with either the fixed or the dual drawout frames. The Upper and Lower Compartments can be easily removed for front access. Simply disconnect the connectors and remove the two top bolts. The panel rests on shoulder bolts. The transformer is somewhat heavy and this could be removed before the panel. The transformer has also two bolts and rest on shoulder bolts.

Figure 20a. Fixed and Dual Draw-Out type Enclosure Outline
Figure 20b. Fixed and Dual Draw-out type 3R Enclosure Outline
Figure 20c. Connections for Fixed Switch 3 pole.

Figure 20d. Connections for Dual Drawout Switch (All Connections Shown at Top, 3 pole shown).

Figure 20e. 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</th>
<th>NUMBER OF CABLES PER PHASE</th>
<th>TERMINAL TEMPERATURE RATING °C (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>#14-3/0</td>
<td>1</td>
<td>90(194)*</td>
</tr>
<tr>
<td>200</td>
<td>#6-300KCMIL</td>
<td>1</td>
<td>90(194)*</td>
</tr>
<tr>
<td>400</td>
<td>1/0 - 750</td>
<td>1</td>
<td>90(194)*</td>
</tr>
<tr>
<td>400</td>
<td>1/0 - 250</td>
<td>2</td>
<td>90(194)*</td>
</tr>
</tbody>
</table>

* Cable must be 90°C rated but shall be determined based on the ampacity of the wire rated at 75°C.
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.

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.

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.

Option 14 Contact Ratings (AUX Form C):

<table>
<thead>
<tr>
<th>RESISTIVE</th>
<th>GENERAL USE</th>
<th>MOTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 VAC</td>
<td>10A</td>
<td>10A 1/3 hp, 240 Vac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/6 hp, 120 Vac</td>
</tr>
</tbody>
</table>

Option 15 Contact Ratings (Position Contacts):

<table>
<thead>
<tr>
<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>NC NO</td>
<td>NC NO</td>
<td>NC NO</td>
<td>NC NO</td>
</tr>
<tr>
<td>240 VAC</td>
<td>10A</td>
<td>2A 1A</td>
<td>7.5</td>
<td>3A 1.5A</td>
</tr>
<tr>
<td></td>
<td>1A</td>
<td>1.5A 0.7A</td>
<td>7.5</td>
<td>2A 1A</td>
</tr>
</tbody>
</table>

WARNING

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 40 ft/lbs.

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

4.5.1 Customer Interface Terminal Blocks

There are terminal blocks inside the unit for customer interface shown in front position Figure 21a and a nested position in Figure 21b. Simply pull up on the knob to relocate the terminal blocks. It will snap into place at the front or nested positions. The terminal blocks provide a set of auxiliary form C position contacts for each contactor (ATS and Bypass on TB4). Up to two more Form C position contacts can be brought out as an option and they would be located on the bottom options panel. There are also terminal blocks for Engine Start, Go to S2, S2 Inhibit power (line and common) for any AC required up to 7 amps continuous and other interfaces. Terminal blocks 4, 6 and 8 are the main customer interfaces. Figures 22a and 22b show the rear view of the ATC-300+ and the ATC-900 controllers.

| TB3  | AC Neutral |
| TB4  | Auxiliary Contacts |
| TB6 (1 and 2) | Engine Start (Red) |
| TB6 (11 and 12) | Go To S2 |
| TB6 (15 and 16) | S2 Inhibit (Load Shed) |
| TB6 (7 and 8) | Alarm (Option 81A) |
| TB7  | AC Line (120 volts) |

Figure 21a. Terminal Blocks for Interface in Front Easy Access Position.

Figure 21b. Terminal Blocks in Nested (Rear) Position.
4.7.2 Closed Transition

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. Open transitions include in-phase, TDN or LVD. See the ATC-900 instruction booklet as there are many different scenarios that could be used for any requirement.

Note: If the ATS contactor is isolated or removed, the Bypass will be fully automatic in the Bypass cell, but only in the Open type transition mode, i.e. In-Phase, TDN, or Load Voltage Decay. In this case, while the ATS is isolated or removed, the user must modify (setpoint) the controller and remove the Closed Transition setpoint.
MODBUS Feature

Figure 22A. Bypass Contactor ATS Rear View of ATC-300+ Controller.

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

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 8.

4.7 Wiring

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. If the multi-tap is not selected as an option, the unit will have one voltage tap with the unit’s voltage ordered. The voltage selection can be domestic or international voltages. See Section 3.3 for more information.
Section 5: Operation of the Bypass Isolation Transfer Switch

5.1 General

**WARNING**

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

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

**WARNING**

NEVER OPERATE THE TRANSFER SWITCH MANUALLY VIA THE OPERATING HANDLE WITH POWER ON S1 AND/OR S2. FAILURE TO HEED THIS WARNING COULD RESULT IN DEATH OR SEVERE INJURY. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON THE 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.

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 the bottom door and turned in a locked position (latch opening is closed) for the system to operate normally in the ATS position. 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. 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 Electrically (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.
5.3 Automatic Operation
The intelligence/supervisory circuits on Eaton transfer switches constantly monitor the condition of both the Source 1 and Source 2 power sources. These circuits automatically initiate an immediate transfer of power from the Source 1 to the Source 2 power source when the source power fails or the voltage level drops below a preset value. Transfer back to the Source 1 power source is automatic upon return of the Source 1 power source. Monitoring the power source is always performed on the line side of the power source to which the switch is connected. The Source 1 power source is usually the preferred source and the transfer switch will always seek this source when it is available and when it is selected in the ATC-900.

On either a Fixed Bypass or Dual Drawout Switch, the intelligence/supervisory circuits will continue to function no matter what contactor is being utilized: the ATS contactor or the Bypass contactor. This powerful patent pending feature allows for a redundant automatic switch.

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
The ATS Contactor (S1) device can be bypassed and isolated by the following sequence (see Figure 26).

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 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 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 switch. 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 in all the way.
   Turn the Bypass/Maintenance Switch to "Auto." The Kirk-Key must be returned (if it was removed) and turned counter-clockwise after closing the draw-out opening or the unit will not go back to the Auto mode. The ATS lights will illuminate when the ATS contactor is closed to S1 and the Bypass contactor is tripped. The "ATS Locked In" and the ATS lights will remain illuminated for a short time (20 seconds) 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
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 to the Isolated position (Isolate lamp is on), 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.

**WARNING**

HAZARDOUS VOLTAGES IN AND AROUND TRANSFER SWITCH EQUIPMENT DURING THE TROUBLE SHOOTING PROCESS CAN CAUSE PERSONAL INJURY AND/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.

5.5.1 Testing the ATS when Isolated or Removed

To test the ATS after Draw-out to the Isolated Position:

1. When in Bypass mode and with the ATS isolated, 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 to the source chosen. If "OFF" the contactor will be in the open position. 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. Since the ATS is in the test position, only one power source is required to switch to S1 or S2. The green and red flags show the position of the contactor.

3. If the ATS is racked out further, the isolated lamp will start to flash. At this point the secondary connector is not connected and a non-electrical manual test may also be performed by inserting the handle on the shaft of the left side of the mechanism and pushing down for tripping or opening of the unit. There are instructions on the label also. For closing on S1 insert a screwdriver into the Close hole. To go to S2, insert two screwdrivers into the Source Select and the Close holes. If the ATS is slid out further on the rails caution should be taken as the stabs in the back of the cell are powered if there is power to S1 or S2. See Section 5.5.3 for full instruction on the manual operation of the controller.

**CAUTION**

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

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 may occur. The electrically 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. If a source is not available, the unit will not manually switch to that position.

**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.

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 controller will show Monitor. The controller 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).

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 Figure 25). 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.

3. To operate the Bypass contactor with the controller active, 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 anytime 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.

**WARNING**

HIGH VOLTAGE ASSOCIATED WITH OPERATIONAL TRANSFER SWITCH EQUIPMENT PRESENT A SHOCK HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. OBSERVE ALL SAFETY PRECAUTIONS IN YOUR GENERATOR SET OPERATIONS AND INSTALLATION MANUALS.
5.5.3 Manual Operation

![WARNING]

DO NOT ATTEMPT TO MANUALLY OPERATE THE ATS WITH THE SWITCH IN THE CONNECTED POSITION. ENSURE THE DEVICE IS IN THE "TEST" ISOLATED OR THE REMOVED POSITION WITH S1 AND S2 DEENERGIZED (TRIPPED-OPEN POSITION). NEVER MANUALLY OPERATE THE FIXED BYPASS CONTACTOR UNLESS ALL POWER IS TURNED OFF (S1 & S2). FAILURE TO HEED THIS WARNING COULD RESULT IN DEATH OR SEVERE INJURY. 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.

To manually operate:

1. With the ATS drawn-out or removed and the ATS Isolated light illuminated, one can manually switch the ATS contactor. The Test-Manual switch must also be in the "Test ATS" position or the logic of the switch will try and close to S1 or S2 and fight the manual wrench.

2. TO TRIP: Locate the manual lever on the left side of the contactor as shown in Figure 27. Attach the handle to the manual lever and rotate down. This will trip the contactor, notice that both indicators will be green or "Off".

3. TO CLOSE ON S1: Depress the S1 Close button located on the operating mechanism of the contactor to bring the contactor to the S1 close position as shown in Figure 28. Notice the top indicator is now red and "on".

4. TO CLOSE S2: Depress the select and S2 Close button (at the same time) located on the operating mechanism of the contactor to bring the contactor to the S2 close position as shown in Figure 29. Notice the bottom indicator is now red and "on".

5. Once the manual operation is complete and automatic operation is desired, trip the contactor, close and latch doors, and rack-in. Also return the Test-Manual Switch to the off position.

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

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Figure 27. Manual Trip using the Manual Operating Handle.

Figure 28. To Close S1

Figure 29. To Close S2.
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 device. The dual draw-out has two. The bottom contactor (ATS) is interlocked and removable as shown in Figure 30. The Bypass contactor is identical to the ATS contactor if it is a dual drawout system versus a fixed type. To remove the Bypass contactor, all power must be removed.

![Figure 30. ATS Contactor & Cartridge Draw-out from the Transfer Switch.](image)

The cartridge rolls on slider rails as shown in Figure 31.

![Figure 31. External Slider Rails that Support the Contactor in the cartridge.](image)

**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 EXTERNAL 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.

To install the contactor, check the unit to be sure the unit is tripped. Electrical interlocks are used to make sure the contactor is tripped before it meets the rear stabs but one should still trip the unit. A 3/8 inch square drive and ratchet with a double extension, which is not provided, will be required to rack the unit in. The top door of the switch should remain closed at all times. Before installing the ATS contactor, the switch must be in the Bypass mode (Transfer to Bypass amber light on) with the power through the Bypass contactor or the power can be off.

![Figure 32. Pushing in Contactor.](image)
6.2 To RACK-IN ATS Contactor

Close and latch the bottom ATS door. The Bypass top door is already closed and latched. Using a 3/8-inch square drive ratchet with two extensions, 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 to open latch opening. When the unit is switched to Bypass mode, the key is now able to turn for (1) minute. If the key is not removed within one (1) minute, simply go back to ATS and then slowly back to the Bypass mode. Using a 3/8-in. square drive and ratchet with extensions, which is not provided, insert the extensions into latch hole through door and turn counter clockwise (see Figure 33) and then stop if it needs to be isolated. If testing is required, stop racking the unit out when the ATS Isolated lamp comes on as shown in Figure 34. If removal of the contactor is desired, 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 and then stop if it needs to be isolated. Drawing out the unit further will detach the secondary connector which gives power and control to the contactor for testing. The connector is located on top of the contactor. 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 in Using a Clockwise Ratcheting Motion.](image)

6.3 To DRAW-OUT ATS Contactor (Isolate)

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 key to open the latch. When the unit is switched to Bypass mode, the key is now retunable 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. Using a 3/8-in. square drive and ratchet with extensions, which is not provided, insert the extensions into latch hole through door and turn counter clockwise (see Figure 33) and then stop if it needs to be isolated. If testing is required, stop racking the unit out when the ATS Isolated lamp comes on as shown in Figure 34. If removal of the contactor is desired, 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 and then stop if it needs to be isolated. Drawing out the unit further will detach the secondary connector which gives power and control to the contactor for testing. The connector is located on top of the contactor. 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. Draw-out and 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. In the isolated position, open the door. It is safe to open the door when the unit in bypass, top door closed and latched, and the ATS contactor is isolated.
There will be a hard stop when disconnected, do not turn the ratchet any more. If contactor removal is required, using appropriate lifting, carefully pull the rails out and lift it off. The contactor weighs about 70 lbs. This is shown in Figure 35.

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

Figures 36 through 38 shows a similar sticker at the bottom of the contactor 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 when racking the contactor in or when power is turned on the system and the contactor is racked in. Remember, the Locked In light will go out after 30 seconds. 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. 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.
6.4  Removal of Bypass Contactor

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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.

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 while the ATS is mounted in a cartridge. If the switch is a dual ATS, the Bypass can remain in the top cell even when the ATS (bottom cell) is removed. The switch will operate automatically (using the ATC controller). There is no need to replace the ATS contactor with the Bypass contactor unless desired.

6.4.1  The Bypass Switching Device

If the Bypass Contractor shown it the picture is a fixed type component, all power must be removed before removing or inserting a Bypass contractor. See instructions “Replacing a Fixed C-Type Contactor Bypass” (see Figure 40). For a dual drawout type switch, the ATS and the Bypass both drawout.

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.

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Figure 38. Label Showing DISCONNECT, TEST, and CONNECT Positions of the Contactor.

Figure 39. One must open the bottom door first and then the Top door can be opened.

Figure 40. The Fixed Bypass Contactor (Top).
Section 7: Testing and Problem Solving

7.1 Operation

Most popular reasons for the contactor to not function properly are:
1. A contactor (one if it is a fixed type switch) is not racked in fully to the locked in position.
2. The doors must be closed and latched.
3. The Kirk-Key must be inserted and turned.
4. The setpoints on the controller are not set correctly.

One can easily test to see if the contactors are racked in fully (Locked In). Simply push the "Lamp Test" button and all the lamps should come on. If the Locked In green lamp is flashing, then a contactor is not fully racked in. Many times the door is not closed and latched. The door light is flashing. The door must be closed and latched to operate in modes 1, 2, 3, and 5 below. The Kirk-Key must also be in the door and the key turned so that the wrench latching door is closed. This must be done for the unit to "start up" in the AUTO position.

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 to the locked position after closing the draw-out opening or the unit will not go back to the ATS mode. The lamps will all flash if this is 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.

The Door and Latch are 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" (3 o’clock) position and back to "Off" will initiate a hard reset of the Controller. This reset function allows the controller to be reset with the doors closed.

7.1.1 Closed Transition Connections

For Closed Transition (ATC-900 only), 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 changed to an open style until the ATS is racked back in. The Bypass will still be an automatic (patented) switch but not for closed transition until the ATS is racked back in.

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**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.

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**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.
7.2 Lights and Logic Panel

Simple lamp tests can be performed using the lamp test push button switch on the option panel. All lamps (not the ATC lamps) should light when being tested. 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 900. When switching to ATS from Bypass, the ATS LOCKED IN lights will remain on for about 30 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 lamp test is pushed and the "Locked In" lamp is flashing, then one of the contactors is not racked in all the way.

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.

**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.

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**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.

**7.3.3 Connecting the Power Sources**

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

**Step 2:** Connect the engine start ,TB6-1,2. (Page 5 of the drawings).

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

**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.
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 twice. The initial password for the ATC-300+ is 0300. Use the up-down, left-right to set this password for running an engine test.

Note: The ATC-300+ Logic 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.

7.4 Problem Solving

**WARNING**

HAZARDOUS VOLTAGE IN AND AROUND ATS EQUIPMENT DURING THE TROUBLESHOOTING PROCESS CAN CAUSE SEVERE PERSONAL INJURY AND/OR DEATH. WHIEN ENERGIZED, AN ARC FLASH AND SHOCK HAZARD EXISTS. CONSULT NFPA 70E AND OSHA GUIDELINES FOR OPERATOR SAFETY PRIOR TO SERVICING, INSPECTING OR OPERATING EQUIPMENT.

**WARNING**

ONLY PROPERLY TRAINED PERSONNEL, FAMILIAR WITH THE ATS EQUIPMENT AND ITS ASSOCIATED EQUIPMENT, SHOULD BE PERMITTED TO PERFORM THE TROUBLESHOOTING FUNCTION. IF AN INDIVIDUAL IS NOT QUALIFIED TO PERFORM THE TROUBLESHOOTING, THE INDIVIDUAL SHOULD NOT ATTEMPT ANY OF THESE PROCEDURES. NEVER ATTEMPT TO SERVICE OR PERFORM MAINTENANCE ON EQUIPMENT WHILE ENERGIZED. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT ON EQUIPMENT BEFORE SERVICING OR INSPECTING. 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.

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 section 7.1. 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 (877-ETN-CARE), the following is the minimum information required to properly address the need:

1. Style number (GO Number) of ATS, if applicable;
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.

**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.
Section 8: Adjustments

8.1 General

Setpoint adjustments can be made in the controller. Refer to the Instruction Booklets supplied or on-line. Besides the IB, there are drawings, test reports, and other instructions/data depending on the options specified.

Refer to IB01602009E, 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

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. This can be used to open an upstream breaker should the source parallel over 100ms.

2. If PC&S relays are used for S1 and S2 Phase reversal, phase sequence, and Unbalanced/Loss, should be adjusted for the application. After April of 2015, the ATC-900 includes all of the relay features. In earlier versions, the phase loss was not integrated (available) into the ATC-900. The ATC-300 does not have phase loss but does incorporate the other features. There are two potentiometers, one for Unbalanced percentage from 5 to 15% and the second is for delay setable from 0 to 10 seconds. The user should set the two potentiometers to their system application.

   Experience has shown that minimum settings should not be used for both potentiometers. The voltage of the relays must match the switch voltage, ex 480VAC with the relays being 480VAC also. Two LEDs.

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.

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.

If condensation is appearing, a 100 watt heater can be installed to aid in the reduction or the elimination of the moisture.

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.
### 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 the 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. Reinstall 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 “wiping” 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 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>

### 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).
Section 10: Renewal Parts Guide

10.1 General

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

![ATS Interior LRU (Line Replaceable Units) Components Diagram]

**Replacement Parts List**

<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>69D6139G01</td>
<td>1</td>
<td>C-FRAME BP XFMR BOX ASSY, Multi-tap</td>
</tr>
<tr>
<td>Truck / Contactor</td>
<td>69C2990G05</td>
<td></td>
<td>BYPASS 3P CONTACTOR DO 480V C FRM</td>
</tr>
<tr>
<td></td>
<td>66A8375G01</td>
<td></td>
<td>BYPASS 3P TRUCK ASSY 480V C FRM</td>
</tr>
<tr>
<td></td>
<td>69C2990G08</td>
<td></td>
<td>BYPASS 3P CONTACTOR FIXED 480V C FRM</td>
</tr>
<tr>
<td></td>
<td>69C2990G09</td>
<td></td>
<td>BYPASS 4P CONTACTOR FIXED 480V C FRM</td>
</tr>
<tr>
<td></td>
<td>69C2990G06</td>
<td></td>
<td>BYPASS 4P CONTACTOR DO 480V C FRM</td>
</tr>
<tr>
<td></td>
<td>66A8375G02</td>
<td></td>
<td>BYPASS 4P TRUCK ASSY 480V C FRM</td>
</tr>
<tr>
<td>Space Heater</td>
<td>8160A41G93</td>
<td>1</td>
<td>OPTION 41 (BP) 100W SPACE HEATER</td>
</tr>
<tr>
<td>Wire Harness Assemblies</td>
<td>Call Factory</td>
<td>1</td>
<td>C-FRAME BYPASS ISOLATION (UPPER) DOOR HARNESS ATC-900 3P &amp; 4P</td>
</tr>
<tr>
<td>Controller</td>
<td>8160A90G19</td>
<td>1</td>
<td>ATC-900+ FINAL ASSY - OPEN TRANSITION (EATON)</td>
</tr>
</tbody>
</table>

For more information visit: [www.eaton.com](http://www.eaton.com)
Up to 400 amps (600 Vac Max) ATC-300+/ATC-900 Contactor Open/Closed Transition Fixed and Dual Drawout Bypass Isolation Automatic Transfer Switch

<table>
<thead>
<tr>
<th>FUNCTION / DEVICE</th>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROL RELAYS</td>
<td>67A2579G13</td>
<td>7</td>
<td>RELAY ASSY 2P, 120 VAC (EATON)</td>
</tr>
<tr>
<td></td>
<td>67A2579G14</td>
<td>1</td>
<td>RELAY ASSY 4P, 120 VAC (EATON)</td>
</tr>
</tbody>
</table>

| LINE REPLACEABLE UNITS

<table>
<thead>
<tr>
<th>FUNCTION / DEVICE</th>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELAY PANEL</td>
<td>69DB133G01</td>
<td>1</td>
<td>C-FRAME BYPASS ISOLATION RELAY PANEL</td>
</tr>
<tr>
<td>LOGIC PANEL</td>
<td>69DB022G01</td>
<td>1</td>
<td>ATS BYPASS ISOLATION LOGIC (Flash type, no battery)</td>
</tr>
<tr>
<td>OPTION PANEL</td>
<td>69DB134G01</td>
<td>1</td>
<td>C-FRAME BYPASS ISOLATION OPTIONS PANEL ASSEMBLY COMPONENTS</td>
</tr>
</tbody>
</table>

| COMPONENTS

<table>
<thead>
<tr>
<th>FUNCTION / DEVICE</th>
<th>PART NUMBER</th>
<th>QTY. PER SWITCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E34VHBL1</td>
<td>3</td>
<td>SWITCH; SELECTOR</td>
</tr>
<tr>
<td></td>
<td>E34PB1</td>
<td>1</td>
<td>SWITCH; E34 PUSHPBTN,BLACK</td>
</tr>
<tr>
<td></td>
<td>3050-4-13-38310</td>
<td>3</td>
<td>RED LIGHT</td>
</tr>
<tr>
<td></td>
<td>3050-4-13-38340</td>
<td>6</td>
<td>GREEN LIGHT</td>
</tr>
<tr>
<td></td>
<td>3050-4-13-38320</td>
<td>3</td>
<td>AMBER LIGHT</td>
</tr>
<tr>
<td></td>
<td>3050-4-13-38330</td>
<td>1</td>
<td>WHITE LIGHT</td>
</tr>
<tr>
<td></td>
<td>E47BMS04</td>
<td>1</td>
<td>LIMIT SWITCH - EXTD. STRAIGHT PLUNGER</td>
</tr>
<tr>
<td></td>
<td>E47BMS10</td>
<td>1</td>
<td>LIMIT SWITCH - ROLLER PLUNGER</td>
</tr>
</tbody>
</table>

| OPTIONAL FEATURES

| NORMAL SOURCE AVAILABLE
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>67A2579G13</td>
<td>1</td>
<td>RELAY ASSEMBLY, 2POLE, 120VAC</td>
</tr>
<tr>
<td></td>
<td>D7PA2</td>
<td>1</td>
<td>C-H D7 RELAY SOCKET</td>
</tr>
<tr>
<td></td>
<td>D7PR2A</td>
<td>1</td>
<td>RELAY; PLUG-IN, 10A, 120VAC</td>
</tr>
<tr>
<td></td>
<td>PMC-A1</td>
<td>2</td>
<td>HOLD DOWN CLIP FOR D2PA6-B1</td>
</tr>
</tbody>
</table>

| EMERGENCY SOURCE AVAILABLE
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>67A2579G13</td>
<td>1</td>
<td>RELAY ASSEMBLY, 2POLE, 120VAC</td>
</tr>
<tr>
<td></td>
<td>D7PA2</td>
<td>1</td>
<td>C-H D7 RELAY SOCKET</td>
</tr>
<tr>
<td></td>
<td>D7PR2A</td>
<td>1</td>
<td>RELAY; PLUG-IN, 10A, 120VAC</td>
</tr>
<tr>
<td></td>
<td>PMC-A1</td>
<td>2</td>
<td>HOLD DOWN CLIP FOR D2PA6-B1</td>
</tr>
</tbody>
</table>
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 and torque to the correct value 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).

**Figure 42. Quick Start. Opening Door with no power and the User Terminal Blocks**

**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 terminal blocks TB6-1, 2 (Red Terminals). (See Section 4.5.1 and Figure 21 and Figure 22.) 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. See page 5 of the wiring diagrams for the terminal blocks.

The ATC-900 I/O connections are brought out to terminal blocks on the bottom panel. See the switch drawings.

**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. The change the setpoints push the button under that menu and put in the password, default 0900.

This is an example. Please use the Controller Instruction Booklet for more detailed instructions and setpoint information.
Up to 400 amps (600 Vac Max) ATC-300+/ATC-900 Contactor Open/Closed Transition Fixed and Dual Drawout Bypass Isolation Automatic Transfer Switch

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