

MODEL 1747-ATS Automatic AC Power Transfer Switch



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I. General Description

The Model 1747-ATS automatic ac power transfer switch enables a Wilmore Series 1747 dc-to-ac inverter to operate in a redundant manner with a second ac source to provide back-up power for essential ac loads. The unit integrates power-failure sensing and automatic high-speed switchover circuitry in a 1U (1.75-inch high) enclosure that is designed for mounting into a standard 19-inch or 23-inch equipment rack. Front-panel controls and indicators include two combination circuit breaker/on-off switches (one in series with each ac line input) and three LED's to display the status of input and output power. Rear-panel receptacles facilitate power distribution to multiple loads (combined load not to exceed 2,200 VA). Also on the rear panel, access is provided to a set of Form C "alarm" contacts for use with a user's remote monitoring system. Two flexible three-conductor power cords exit the rear panel for connection to the "preferred" and "back-up" ac sources.

II. Installation and Operation

Caution: The Model 1747-ATS is intended for installation using standard premises wiring practices wherein both ac sources share a common neutral connection. The neutral conductors of the two ac-input power cords are commoned together internal to the unit, along with the neutral connections of the output receptacles. The line conductors (sometimes referred to as the "hot" conductors) of the power cords are switched via the internal line sensing and switchover circuitry and then distributed to the output receptacles. The Model 1747-ATS's chassis and its output-receptacle ground connections are commoned together internal to the unit, and the enclosure should be grounded in accordance with local and national electrical codes using the chassis ground stud provided on the unit's rear panel.

The Model 1747-ATS is designed for mounting into a standard 19-inch or 23-inch equipment rack. Install the appropriate mounting brackets to the chassis using the hardware provided (brackets for both sizes of racks are included with the unit). Securely fasten the unit to the equipment rack, being careful to provide additional support to the chassis and power cords as needed to avoid distorting the mounting brackets and enclosure.

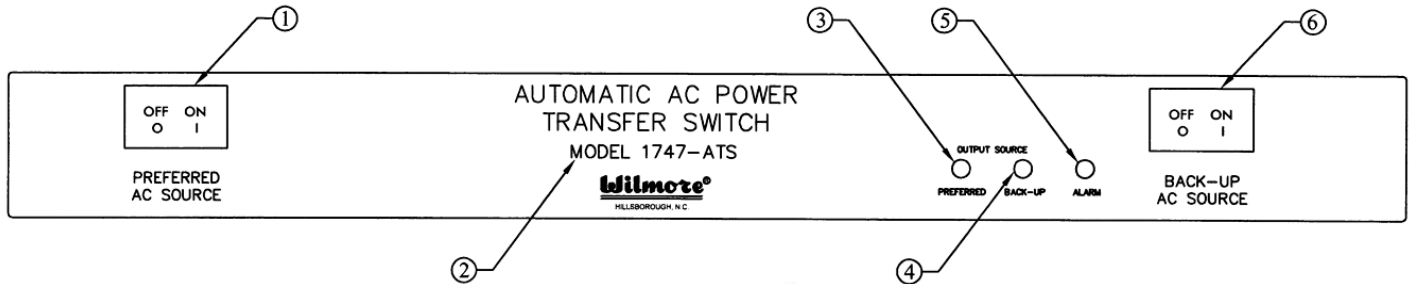
Before making any wiring connections to the Model 1747-ATS, switch both front-panel circuit breakers to the OFF position and make sure that both ac sources are de-energized. Connect the input power cord marked "preferred" to the ac source which will normally power the load, and connect the cord marked "back-up" to the alternate ac source. Before switching the front-panel circuit breakers to the ON position and before plugging any loads into the output receptacles on the back panel, use the following procedure to verify correct operation (if any problems are encountered, please see the TROUBLESHOOTING GUIDE in this booklet):

- 1) Energize both the preferred and back-up ac power sources (Model 1747-ATS front-panel circuit breakers still in the OFF position).
- 2) Switch the front-panel circuit breaker labeled "back-up ac source" to the ON position. The front-panel LED's should indicate that the back-up source is now connected to the output receptacles (the amber LED is illuminated) and that an alarm condition exists (the preferred source is not present, therefore the red LED is illuminated).
- 3) Switch the front-panel circuit breaker labeled "preferred ac source" to the ON position (i.e. both circuit breakers ON). After a delay of approximately 4 seconds, the unit should switch to the preferred source. The front-panel LED's should now indicate that the preferred source is connected to the output receptacles and that the alarm condition has been remedied (only the green LED is illuminated).

- 4) Switch the “back-up ac source” circuit breaker to the OFF position. After a delay of approximately 4 seconds, the front-panel LED’s should indicate that the preferred source is still connected to the output receptacles (the green LED remains illuminated), but that an alarm condition exists (the back-up source is not present, therefore the red LED is illuminated).
- 5) Switch the “back-up ac source” circuit breaker back to the ON position. The red LED should extinguish, indicating that the back-up ac source is now available and the alarm condition has been remedied. The operational check is complete.

III. Front-Panel Controls and Indicators

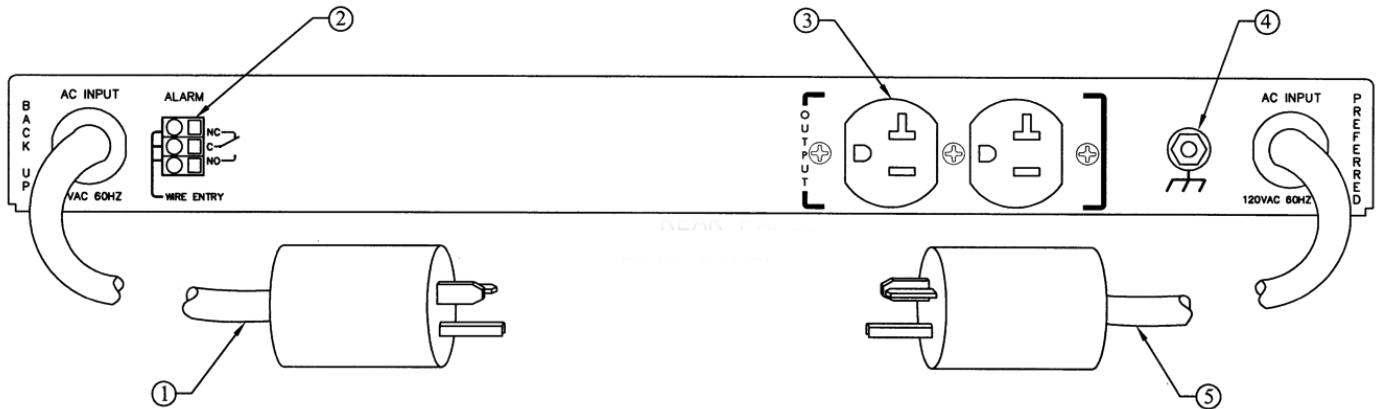
Figure 1. Front Panel



- ① **AC INPUT CIRCUIT BREAKER/PREFERRED AC SOURCE:** This is a combination input power switch and circuit breaker provided in series with the ac line from the preferred ac source. The circuit breaker rating is 20 amperes.
- ② **MODEL NUMBER:** This number indicates a variety of information about the unit and should be referenced in any communication with the factory. A suffix may be present, indicating a modification to the standard unit (consult the factory for further information regarding any modifications).
- ③ **OUTPUT SOURCE LED/PREFERRED:** This green LED is illuminated when the transfer circuitry has selected the preferred ac source to power loads plugged into the rear-panel receptacles.
- ④ **OUTPUT SOURCE LED/BACK-UP:** This amber LED is illuminated when the transfer circuitry has selected the back-up ac source to power loads plugged into the rear-panel receptacles.
- ⑤ **ALARM LED:** This red LED is illuminated when either of the ac input sources is not present or when either of the front-panel circuit breakers is in the OFF position.
- ⑥ **AC INPUT CIRCUIT BREAKER/BACK-UP SOURCE:** This is a combination input power switch and circuit breaker provided in series with the ac line from the back-up ac source. The circuit breaker rating is 20 amperes.

IV. Rear-Panel Wiring Connections

Figure 2. Rear Panel



- ① **AC INPUT/BACK-UP:** This power cord is for connection to the 120-Vac, 60-Hz single-phase back-up ac power source. The cord is 3-conductor #12 AWG, 9 feet in length and terminated in a NEMA type 5-20P plug.
- ② **ALARM TERMINALS:** This 3-position terminal block provides access to a set of Form C contacts which monitor the presence of the preferred and back-up ac sources. The NO (normally open), C (common) and NC (normally closed) contacts have maximum voltage, current, and power ratings of 125 volts (ac or dc), 2A, and 60 watts, respectively. In this context, "normal" means that both ac sources are present, both front-panel circuit breakers are ON, and the unit is functioning normally.

The terminal block is a WAGO® Series 731 and provides a spring-clamp mechanism for use with #16-#26 AWG stranded or solid wire. To connect to the terminal block:

- 1) Strip 5/16" of insulation from the wire.
- 2) Insert the tip of a narrow-bladed screwdriver or similar tool into the slot on the face of the terminal block immediately to the right of the wire entry port.
- 3) Press the tool firmly into the slot to open the wire clamp. Use the tool as a lever to open the clamp further for larger wires.
- 4) Insert the wire into the wire entry port (wire will "bottom out" when fully inserted).
- 5) Remove the tool to clamp the wire into place.

- ③ **AC OUTPUT:** Two ac receptacles, NEMA type 5-20R, are provided to facilitate power distribution to multiple loads. The maximum load current must not exceed 2,200 volt-amperes (VA) total for both receptacles combined.
- ④ **CHASSIS GROUND TERMINAL:** Connection to chassis ground is provided via a #10-32 stud and locking nut.
- ⑤ **AC INPUT/PREFERRED:** This power cord is for connection to the 120-Vac, 60-Hz single-phase preferred ac power source. The cord is 3-conductor #12 AWG, 9 feet in length and terminated in a NEMA type 5-20P plug.

V. Maintenance Information and Trouble-Shooting Guide

Other than preventing dust and debris accumulation on internal components and external surfaces of the unit, no periodic maintenance should be required.

If a problem is encountered using the Model 1747-ATS, the user should first make sure that the problem is definitely within the unit before returning it for repair. The following chart lists a few common operating modes and system problems external to the unit that may occur during installation or operation. Taking a few moments to read through this chart may save an unnecessary return for repair.

SYMPTOM	POSSIBLE EXTERNAL CAUSES
One or both front-panel circuit breakers trip.	Overload/external wiring error.
All LED's are OFF.	1. Both ac sources are absent. 2. Both front-panel circuit breakers are switched OFF.
Green and red LED's are ON.	1. Back-up ac source is absent. 2. Front-panel circuit breaker for back-up source is switched OFF.
Amber and red LED's are ON.	1. Preferred ac source is absent. 2. Front-panel circuit breaker for preferred source is switched OFF.
Unit cycles between preferred and back-up sources, remaining on the back-up source for approximately 4-5 seconds.	Preferred source is unable to power the load(s). The load is then switched to the back-up source which allows the (now) unloaded preferred source to recover. The sensing circuitry responds to its recovery by switching the load back to the preferred source after a 4-5 second delay, starting the cycle over again.
Unit cycles between preferred and back-up sources when the preferred source is absent or when the front-panel circuit breaker for the preferred source is switched OFF.	Back-up source is unable to power the load(s). With both sources thus unavailable, the load is then switched back to the default preferred source, allowing the (now) unloaded back-up source to recover. The sensing circuitry responds to its recovery by switching the load to the back-up source, starting the cycle over again.

A damaged or malfunctioning unit should be returned to Wilmore for repair. Multiple-component cascade failures in power conversion circuitry can greatly complicate trouble-shooting procedures, and factory technicians familiar with the circuitry can locate the problem quickly, explore adjacent circuitry for stressed or damaged components, and subject the inverter to a thorough retest.

Wilmore maintains a **Return Material Authorization** system in order to efficiently track your inbound shipment and expedite its repair and return to you. Before shipping material for repair to Wilmore, please call (919) 732-9351 or email info@wilmoreelectronics.com and request an **RMA Number** for your shipment. If possible, please provide the complete model number of the equipment, its serial number, and a brief description of the problem. Place this **RMA Number** on the outside of the package and ship prepaid to:

WILMORE ELECTRONICS CO., INC.
607 U.S. 70A East
P.O. Box 1329
Hillsborough, NC 27278

VI. Limited Warranty

Wilmore Electronics Company, Inc. warrants this product to be free from defects in material and workmanship for one (1) year after delivery to the original purchaser. During this period, a defective product for which an authorization to return the product has been given, shall be returned to Wilmore freight prepaid. The products will be repaired, replaced, or credit allowed only if the defect, after examination by Wilmore, is determined to be a defect in material or workmanship. If this returned product is determined by Wilmore to have suffered from user misuse or abuse or to have been opened or modified without written instructions from Wilmore, or if the date of receipt of a request for return authorization exceeds the 1-year warranty period, the warranty is null and void. In such cases, Wilmore will determine the cost of repair, quote this price to the purchaser, and continue as advised by the purchaser.

The sole obligation of Wilmore and the purchaser's exclusive remedy under this or any other warranty, expressed or implied, is the repair or replacement of a defective product as provided above, or the issuance of credit in an amount not to exceed the contract price for the product deemed to be defective. Wilmore makes no warranty of merchantability or fitness for a particular use. Wilmore shall not be responsible for incidental or consequential damage, whether or not foreseeable, caused by defects in this product. There are no other warranties which shall extend the description above.