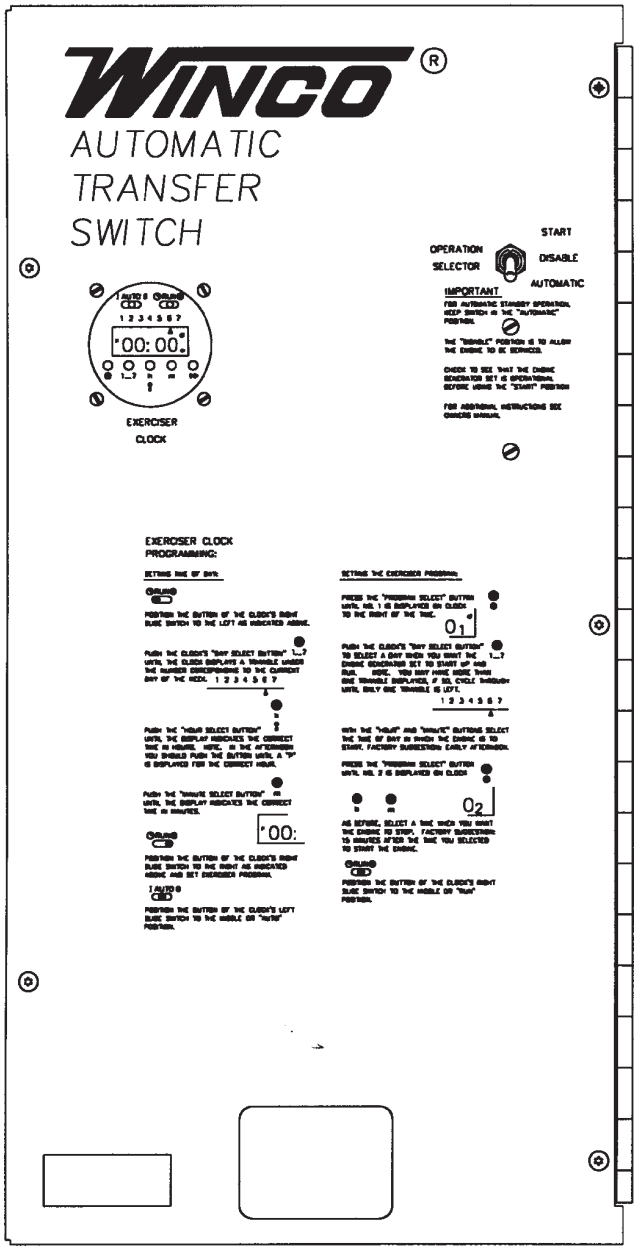
WINCO®

A Division of DTE Dyna Technology Inc

AUTOMATIC TRANSFER SWITCH

INSTALLATION AND OPERATORS MANUAL



Read and understand all instructions in the manual before starting and operating the generator set.

USING THIS MANUAL

Congratulations on your choice of a Winco Automatic Transfer Switch. You have selected a high-quality, precision Automatic Transfer Switch designed and tested to give years of satisfactory service.

To get the best performance from your new Automatic Transfer Switch, it is important that you carefully read and follow the operating instructions in this manual.

Should you experience a problem please follow the "Things To Check" near the end of this manual. The warranty listed in this manual describes what you can expect from WINCO should you need service assistance in the future.

COPY YOUR MODEL AND SERIAL NUMBER HERE

No other WINCO Automatic Transfer Switch has the same serial number as yours. It is important that you record the number and other vital information here. If you should ever need to contact us on this unit it will help us to respond to your needs faster.

MODEL_____

SERIAL NUMBER_____

PURCHASE DATE_____

DEALER_____

DEALER PHONE # _____

TABLE OF CONTENTS

SAFETY INFORMATION

This engine generator set has been designed and manufactured to allow safe, reliable performance. Poor maintenance, improper or careless use can result in potential deadly hazards; from electrical shock, exhaust gas asphyxiation, or fire. Please read all safety instructions carefully before installation or use. Keep these instructions handy for future reference. Take special note and follow all warnings on the unit labels and in the manuals.

ANSI SAFETY DEFINITIONS

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DANGER:

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

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WARNING:

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

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CAUTION:

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

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NOTE:

CAUTION is also used on the unit labels and in this manual to indicate a situation that could result in serious damage or destruction of the equipment and possible personal injury.

1. **ELECTRIC SHOCK -** The output voltage present in this equipment can cause a fatal electric shock. This equipment must be operated by a responsible person.

   a. Do not allow anyone to operate the generator without proper instruction.
   b. Guard against electric shock.
   c. Avoid contact with live terminals or receptacles.
   d. Use extreme care if operating this unit in rain or snow.
   e. Use only three-prong grounded receptacles and extension cords.
   f. Be sure the unit is properly grounded to an external ground rod driven into the earth.

2. **FIRE HAZARD -** Natural gas and L.P. present a hazard of possible explosion and/or fire.

   a. Do not refuel when the engine is running or hot. Allow the engine to cool at least two minutes before refueling.
   b. Keep fuel containers out of reach of children.
   c. Do not smoke or use open flame near the generator set or fuel tank.
   d. Keep a fire extinguisher nearby and know its proper use. Fire extinguishers rated ABC by NFPA are appropriate.
   e. Store fuel only in an approved container, and only in a well-ventilated area.
   f. Follow local codes for closeness to combustible material.

3. **DEADLY EXHAUST GAS** - Exhaust fumes from any gasoline engine contain carbon monoxide, an invisible, odorless and deadly gas that must be mixed with fresh air.

   a. Operate only in well ventilated areas.
   b. Never operate indoors.
   c. Never operate the unit in such a way as to allow exhaust gases to seep back into closed rooms (i.e. through windows, walls or floors).

4. **NOISE HAZARD** - Excessive noise is not only tiring, but continual exposure can lead to loss of hearing.

   a. Use hearing protection equipment when working around this equipment for long periods of time.
   b. Keep your neighbors in mind when permanently installing this equipment.

5. **CLEANLINESS** - Keep the generator and surrounding area clean.

   a. Remove all grease, ice, snow or materials that create slippery conditions around the unit.
   b. Remove any rags or other material that could create potential fire hazards.
   c. Carefully clean up any gas or oil spills before starting the unit.
   d. Never allow leaves or other flammable material to build up around the engine intake or exhaust area.

6. **SERVICING EQUIPMENT** - All service, including the installation or replacement of service parts, should be performed only by a qualified technician.

   a. Use only factory approved repair parts.
   b. Do not work on this equipment when fatigued.
   c. Never remove the protective guards, cover, or receptacle panels while the engine is running.
   d. Use extreme caution when working on electrical components. High output voltages from this equipment can cause serious injury or death.
   e. Always avoid hot mufflers, exhaust manifolds, and engine parts. They all can cause severe burns instantly.
   f. Installing a generator set is not a “do-it-yourself” project. Consult a qualified, licensed electrician or contractor. The installation must comply with all national, state, and local codes.

TESTING POLICY:

Before any Automatic Transfer Switch (A.T.S.) is shipped from the factory, it is fully checked for performance.

Rated capability of the Automatic Transfer Switch is based on engineering tests of typical units, and is subject to, and limited by, the temperature, and other conditions specified by the manufacturer.

DESCRIPTION

These wall mounted Automatic Transfer Switches (A.T.S.) are designed for inside installation. The A.T.S. consists of a line side contactor and a generator side contactor. The contactors are both electrically and mechanically interlocked.

A seven day electronic exerciser clock is installed in the A.T.S. as standard equipment. The exerciser clock is electronically programmable, which allows you to set multiply exercise periods during the week. These exercise periods can be from 1 second long to hours long depending on how long you want it operate.

The A.T.S. also contains the power failure sensing circuitry necessary to send a start/stop signal to the engine generator set. These switches are designed to close a dry contact (start 1 to start 23) upon failure of normal power. The three phase A.T.S. contain a three phase power monitor that monitors the voltage level and will disconnect line power at a predetermined voltage level, providing brown out protection. The single phase switch uses a 240 volt relay to sense power failure and provides only limited protection during brown outs. The three phase monitor is also phase rotation sensitive.

During normal operation the A.T.S. will supply normal line power to the loads connected to the load terminals in the switch. Upon an interruption of normal electrical service the A.T.S. will close the start/stop relay sending a start signal to the engine-generator set. Once the engine-generator is producing electricity, the Automatic Transfer Switch will transfer the connected loads to the engine-generator set. Upon restoration of normal electrical service the A.T.S. will sense the return of the normal commercial power and retransfer the connected loads back to the normal power source. At the same time the start/stop relay will open removing the start signal being sent to the engine control, allowing the engine-generator set to time out and shut down.

UNPACKING INSTRUCTIONS

**** NOTICE ****

When unpacking the Automatic Transfer Switch, be sure to inspect it carefully for freight loss or damage. If loss or damage is noted at the time of delivery, require that the person making the delivery make note of the loss or damage on the freight bill, or affix his signature under the consignor's memo of the loss or damage. Contact the carrier for claim procedures.

When loss or damage is noted after delivery, segregate the damaged material, and contact the carrier for claim procedures. Be sure to retain the packaging material for carrier inspection.

"Concealed Damage" is understood to mean damage to the contents of a package which is not evident at the time of delivery by the carrier, but which is discovered later. The carrier or carriers are responsible for merchandise lost or damaged in transit. The title to goods rests with the consignee when generators are shipped F.O.B. factory, and only the consignee can legally file a claim.

UNPACKING:

1. Carefully remove the carton.

2. After inspecting the Automatic Transfer Switch for external physical damage, carefully inspect the contactors, contactor interlocks and the contactor mountings, to insure no damage has occurred to the contactors during shipment and handling.

3. Check inside the carton for the owner's manual, wiring diagram and parts list.

INSTALLATION

General Information

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***** WARNING ****
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*Before proceeding with the installation, be sure the operation selector switch is in the **STOP** position.*

Before beginning the installation process recheck the rating of the transfer switch to be certain it can handle the intended load and is compatible with the entrance voltage, phase and current ratings. Plans for installation should be prepared with proper attention to mechanical and electrical engineering detail to assure a satisfactory installation. The information in this manual is offered only as a guide to finalizing your installation plans.

AUTOMATIC TRANSFER SWITCH SIZES

MODEL	VOLTAGE	PH	CONTACTOR SIZE LINE	GEN.
110/60ATS-3/C	120/240	1	110 AMP	60 AMP
ATS-4/D 100/100	120/208	3	100 AMP	100 AMP
ATS-17/D 100/100	120/240	3	100 AMP	100 AMP
ATS-18/B 100/100	277/480	3	100 AMP	100 AMP
ATS-18/B 225/225	277/480	3	225 AMP	225 AMP
ATS-4/D 225/225	120/208	3	225 AMP	225 AMP
ATS-17/D 225/225	120/240	3	225 AMP	225 AMP
230/150ATS-3/C	120/240	1	230 AMP	150 AMP
230/150ATS-4/D	120/208	3	230 AMP	150 AMP
230/150ATS-17/D	120/240	3	230 AMP	150 AMP
ATS-4/D 400/300	120/208	3	400 AMP	300 AMP
ATS-17/D 400/300	120/240	3	400 AMP	300 AMP
400/320ATS-3/C	120/240	1	400 AMP	320 AMP

Optional A.T.S. sizes are available to meet specific needs. If you need a switch of a different size contact WINCO, Inc.

INSTALLATION NOTES

The load current carrying wires (L) and (T) must be sized to handle the maximum load current without excessive voltage drop. By code, the wire must be heavy enough to handle the full current rating of the main line circuit-breaker (or fuse) in the entrance (or sub-panel) protecting the transfer switch.

All wires should be installed in rigid or flexible conduit. (Knockouts are provided in the control box)

Because of the many different types of service, feeder, and distribution equipment, no specific wiring instructions can be provided. It is, however, recommended that only copper wire be used. In all cases it is essential that while the load is connected to the generator, there can be absolutely no feedback from the generator to the power line or the power line to the generator. When properly installed, the normal A.T.S. control and safety systems will eliminate all paths for feedback. Check with your local electrical inspector on applicable local, state and federal codes.

NOTE:
It is an excellent idea to install a disconnect in the incoming power line wiring directly in front of the A.T.S. panel. This will allow you to test the generator under load. Should you ever have to work on the switch, you will be able to disconnect the power and work on the switch cold, without having the power company pull your meter.

To wire the automatic transfer switch into the existing wiring, first determine which circuits will be on the emergency load circuit. If the entire load is to be transferred, the transfer switch can be wired in directly after the service entrance, provided the service entrance ampere rating is within the transfer switch's rated capability. (See figure 3 and figure 5)

If only specific circuits are to be powered during power failure conditions, an additional distribution panel designated "emergency distribution panel" must be installed. All selected emergency circuits are removed from main distribution panels and reinstalled in the emergency distribution panel. Suggested circuits: freezer, refrigerator, furnace, emergency lights, sump pump, emergency outlet circuits, etc. Total running load must not exceed generator rating. (See figure 4)

FIGURE 3

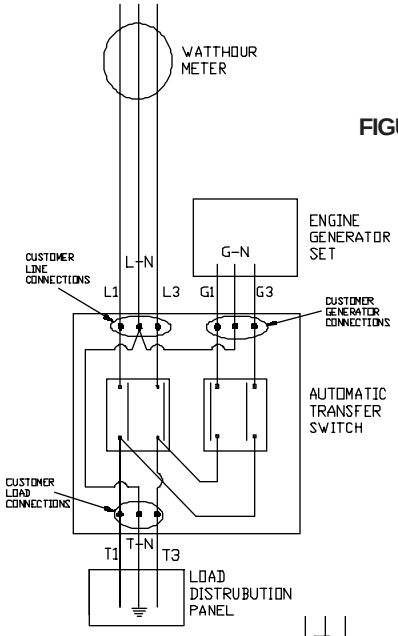
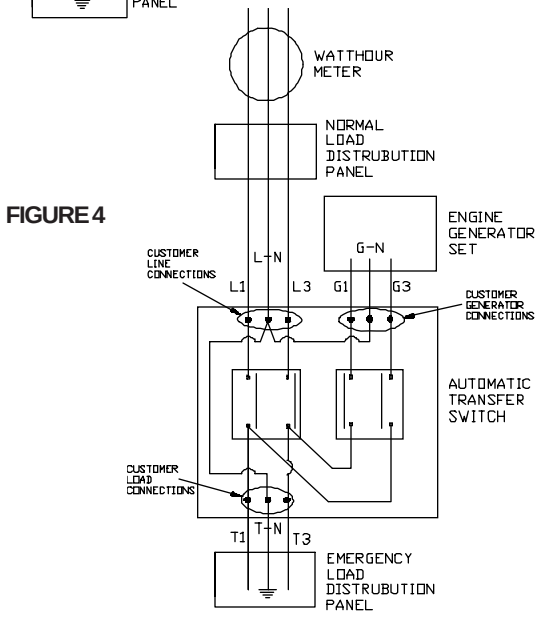


FIGURE 4



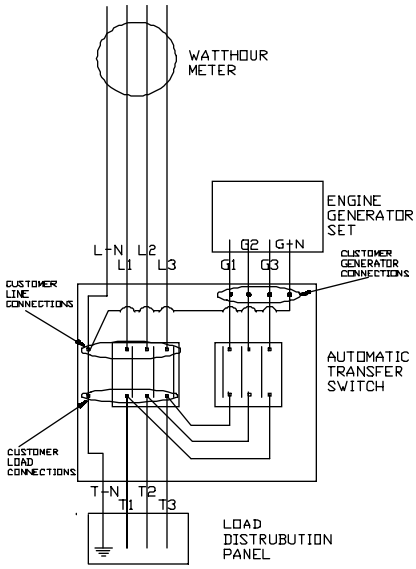


FIGURE 5

INSTALLING THE AUTOMATIC TRANSFER SWITCH (A.T.S.)

GENERAL INFORMATION

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***** WARNING *****

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EQUIPMENT DAMAGE- Protect the switch from construction grit and metal chips to prevent a malfunction or shortened life of the switch.

The Automatic Transfer Switch connects the load (lights, furnace, outlets, etc.) to the normal power line during standby. When normal power fails, the A.T.S. starts the engine generator set, disconnects the power line and then connects the load to the standby generator set. When normal power is restored, the automatic switch retransfers the electrical load to the normal service and stops the engine. The A.T.S. panel should be mounted as close to the distribution panel as possible.

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***** WARNING *****

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All wiring must be done by a licensed electrician, and must conform to the national electrical code and comply with all state and local codes and regulations. Check with your electrical inspectors before proceeding!

Before installing the Automatic Transfer Switch you must first ensure that the line side contactor will be of sufficient size to handle your complete service. (i.e. the main line breaker must not be larger than the line side contactor rating.) If you will not be able to transfer the complete electrical system it will be necessary to install a secondary emergency distribution panel.

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***** DANGER *****

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Be certain the operation selector switch on the front of the A.T.S. Control is in the "stop" position and the main power switch "off". For your own protection, verify these important safety precautions yourself with reliable instruments before proceeding.

A.C. ELECTRICAL CONNECTIONS

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***** WARNING *****

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A FUSED DISCONNECT/CIRCUIT BREAKER MUST BE INSTALLED BETWEEN THE GENERATOR AND THE A.T.S. PANEL TO PREVENT OVERLOADING AND BURNING OUT OF THE GENERATOR. FAILURE TO PROVIDE A FUSED DISCONNECT OR CIRCUIT BREAKER FOR GENERATOR RATING WILL VOID YOUR WARRANTY IN CASE OF GENERATOR FAILURE.

SINGLE PHASE A.T.S. CONNECTIONS

The generator terminals (power in from the generator) in the A.T.S are marked "GENERATOR - G1, G-N, G3". The "hot" leads G1 and G3 are wired to the generator side contactor, terminals G1 and G3.

The line terminals (normal power source) in the A.T.S. are marked "LINE - L1, L-N, L3". The "hot" leads L1 and L3 are wired to the line side contactor, terminals L1 and L3.

The load terminals (power out to loads) in the A.T.S. are marked "LOAD - T1, T-N, T3". The "hot" leads T1 and T3 are wired to the load lugs T1 and T3.

All three neutral connections are made to the appropriate neutral lugs. These lugs have been prewired common in the A.T.S. A neutral to ground bond has also been installed in the A.T.S. panel. If your system requires an isolated neutral this bond, a copper jumper strap, should be removed. If this jumper strap is removed remember to properly ground the Automatic Transfer Switch using the grounding lug provided.

THREE PHASE A.T.S. CONNECTIONS

The standby generator terminals in the A.T.S are marked "GENERATOR - G1, G2, G3 and G-N". The "hot" leads G1, G2 and G3 are wired to the generator side contactor, terminals G1, G2 and G3.

The line terminals in the A.T.S. are marked "LINE - L1, L2, L3" and L-N. The "hot" leads L1, L2 and L3 are wired to the line side contactor, terminals L1, L2 and L3.

The load terminals in the A.T.S. are marked "LOAD - T1, T2, T3 and T-N". The "hot" leads T1 and T3 are wired to the load lugs T1, T2 and T3.

All three neutral connections are made to the appropriate neutral lugs. These lugs have been prewired common in the A.T.S. A neutral to ground bond has also been installed in the A.T.S. panel. If your system requires an isolated neutral this bond, a copper jumper strap, should be removed. If this jumper strap is removed remember to properly ground the Automatic Transfer Switch using the grounding lug provided.

THREE PHASE POWER MONITOR

All three phase Automatic Transfer Switches have a three phase power monitor installed in them to monitor each phase for low voltage. This three phase monitor is phase rotation sensitive also, and comes from the factory set up for A-B-C phase rotation. If you have trouble getting the A.T.S. to pickup the line power on initial installation, try switching the A and B phase on the monitor. Your rotation may be C-B-A. If so, be sure to match the generator rotation to your current normal power rotation or your three phase motors will try to turn backwards.

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******* WARNING *******
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When installing a Three Phase 240 Volt Delta system be sure you know which lead is the high voltage leg (208 Volt line to neutral). The Automatic Transfer Switch is set up for the high voltage lead to be connected at G3, T3 and L3. Under no circumstance use G1, T1 and L1 as doing so will damage the A.T.S. controls.

D.C. ELECTRICAL INTERCONNECTION

*********CAUTION********
Never run the AC and DC wiring in the same conduit.

The start circuitry in these A.T.S. is a dry contact closure to operate system. When the power fails the start/stop relay on the door closes and connects start 1 wire to Start 23. These connections are not polarity sensitive. If your Engine-Generator set needs any other type of signal to operate, you will need to contact the WINCO, Inc. Service Department at 507-357-6831.

Two control wires are required to be installed between the A.T.S. panel and the generator control. Depending on the distance 14 to 16 gauge stranded wire should be sufficient. These wires should be labeled “Start 1” and “Start 23”.

SETTING THE EXERCISER CLOCK

Setting the current time and date.

1. Position the top right hand (RUN) slide switch to the left position.

2. Push the clock’s “Day Select Button” until the clock displays a triangle under the number corresponding to the current day of the week. (Monday is day 1, Sunday is day 7)

3. Push the “Hour Select Button” until the display indicates the correct time in hours. Note: In the afternoon you should push the button until a “P” is displayed beside the correct hour.

4. Push the “Minute Select Button” until the display indicates the correct time in minutes.

5. Position the top right hand (RUN) slide switch to the center position. The correct time and date should now be displayed.

Setting the Exerciser Program:

1. Position the top right hand (RUN) slide switch to the right hand position.

2. Position the top left hand (AUTO) slide switch to the center position.

3. Press the “Program Select Button” until No 1 is displayed on the clock to the right of the time.

4. Push the “Day Select Button” to select the day you want the engine generator set to start up and run. Note: You can get more than one triangle displayed on the clock. If this happens just keep pressing the button and it will work back through the cycle and display only one triangle under whichever day you desire.

5. With the “Hour” and “Minute” buttons select the time of day you want the engine to start up.

6. Press the “Program Select Button” until No. 2 is displayed on the clock.

7. Push the “Day Select Button” to select the day you want the engine to stop. This must be the same day you selected in step 4 above.

8. With the “Hour” and “Minute” buttons, select the time you want the engine to stop. It is recommended you let the engine run at least 15 minutes during any exercise period.

9. Position the top right hand (RUN) slide switch to the center (RUN) position.

CLOCK NOTES:

This seven day exerciser clock has seven additional program cycles available. Always keep in mind the odd number turns the unit on and the even number shuts the unit off. (i.e. (3 on, 4 off) (5 on, 6 off) etc.)

The relay in the clock will not work unless the transfer switch is installed and powered up. The relay needs 120 volts AC to operate.

If, when you finish programming the clock, you get an "EEEE" on the display, it stands for error. The most common error is that the day of operation has not been properly set at each step or a program has been turned on and not turned off. (i.e. programs not properly grouped 1& 2, 3 & 4, 5 & 6, etc.)

On the face of clock is a small button marked "R", this is a reset switch. Depressing this switch will remove all programming in the clock including the time. Use a small screwdriver or the tip of a pencil to depress this button. This should be used only as a last resort.

INITIAL START UP

Move the selector switch on the engine generator set to the "AUTOMATIC" position. Next move the selector switch on the A.T.S. panel to the "START" position. The engine generator set should start up. If it fails to start at this time, check the selector switch on the engine generator to be sure it is in the "automatic" position. Also check to be sure the DC interconnection wiring is correct. When the selector switch on the A.T.S. is moved to the "DISABLE" position the engine generator set will shut off. As long as line power is still applied to the transfer switch during this test period the A.T.S. will not transfer the load to the generator.

Next you need to test the complete system. To accomplish this you will have to fail the incoming line power to the A.T.S. panel. First move both selector switches to the automatic position. Then fail the incoming power. All the loads connected to the A.T.S. should now be dead. The engine generator set should now start up. As soon as the engine generator set reaches operating voltage the generator side contactor will close and the load will be applied to the engine generator.

Restoring the line power to the transfer switch will cause the generator side contactor to open. The line side contactor will close as soon as the generator side contactor clears the mechanical interlock and closes the electrical interlock. These interlocks ensure that you get a clean 'break before make' action in the transfer switch.

The restoration of line power also breaks the run signal to the engine generator set allowing it to shut down.

This completes your installation and unit testing. ALWAYS leave the system in automatic mode unless servicing the unit. For automatic operation, keep both the generator set and transfer selector switches in the "AUTOMATIC" position.

TROUBLESHOOTING HINTS

ATS PANEL WILL NOT TRANSFER TO EMERGENCY SUPPLY (GENERATOR).

1. No AC generator output from generator.
2. Broken or defective mechanical/electrical inter locks.
3. Defective holding coil in the generator side contactor.
4. Wiring error between generator set and transfer switch.
5. Defective Start Stop Relay

ATS PANEL WILL NOT CLOSE WITH NORMAL POWER APPLIED.

1. Proper normal line power not available at line terminals in ATS panel.
2. Defective holding coil in line side contactor.
3. Broken or defective mechanical/electrical inter locks.
4. Defective Start Stop Relay.
5 Defective Phase Failure Monitor. (Three Phase Units only)
6. Phase Rotation wrong to the Phase Failure Monitor.

PREVENTIVE MAINTENANCE

Reasonable care and preventive maintenance will insure high reliability and a long life for the Automatic Transfer Switch.

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***** WARNING *****
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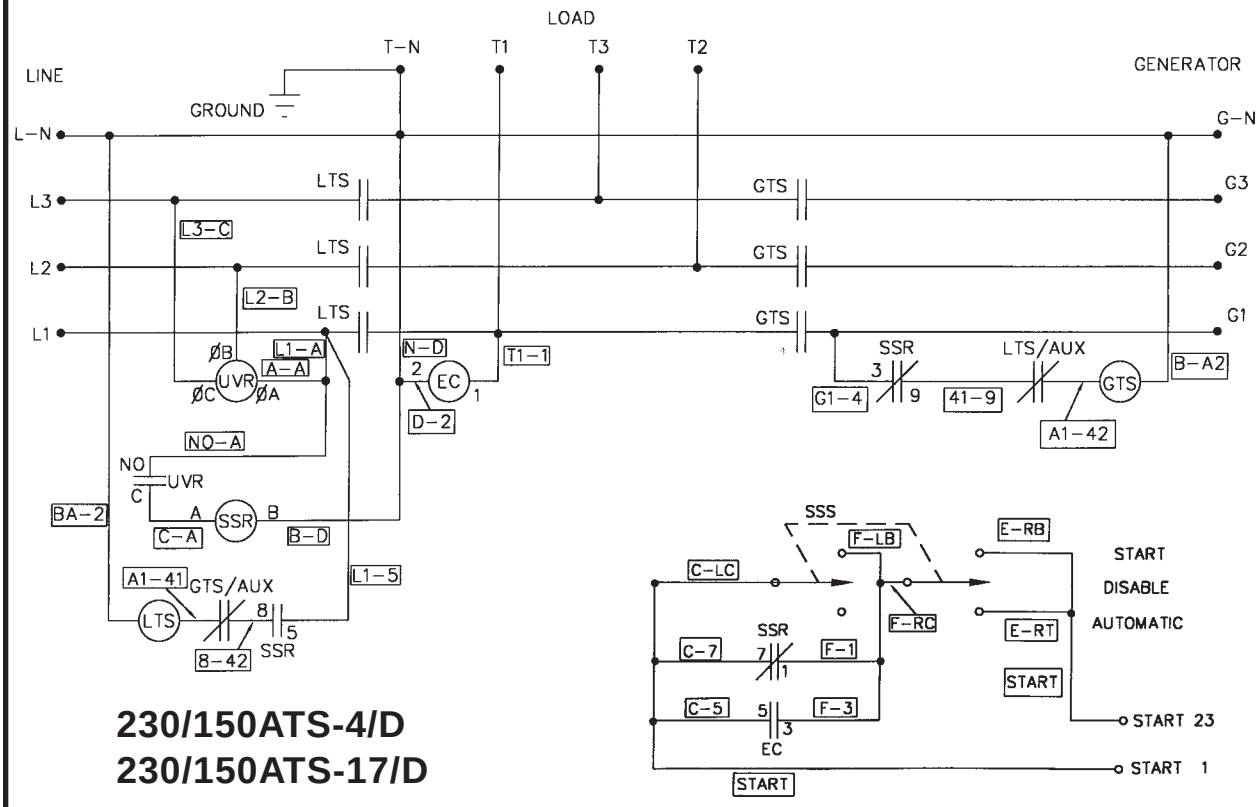
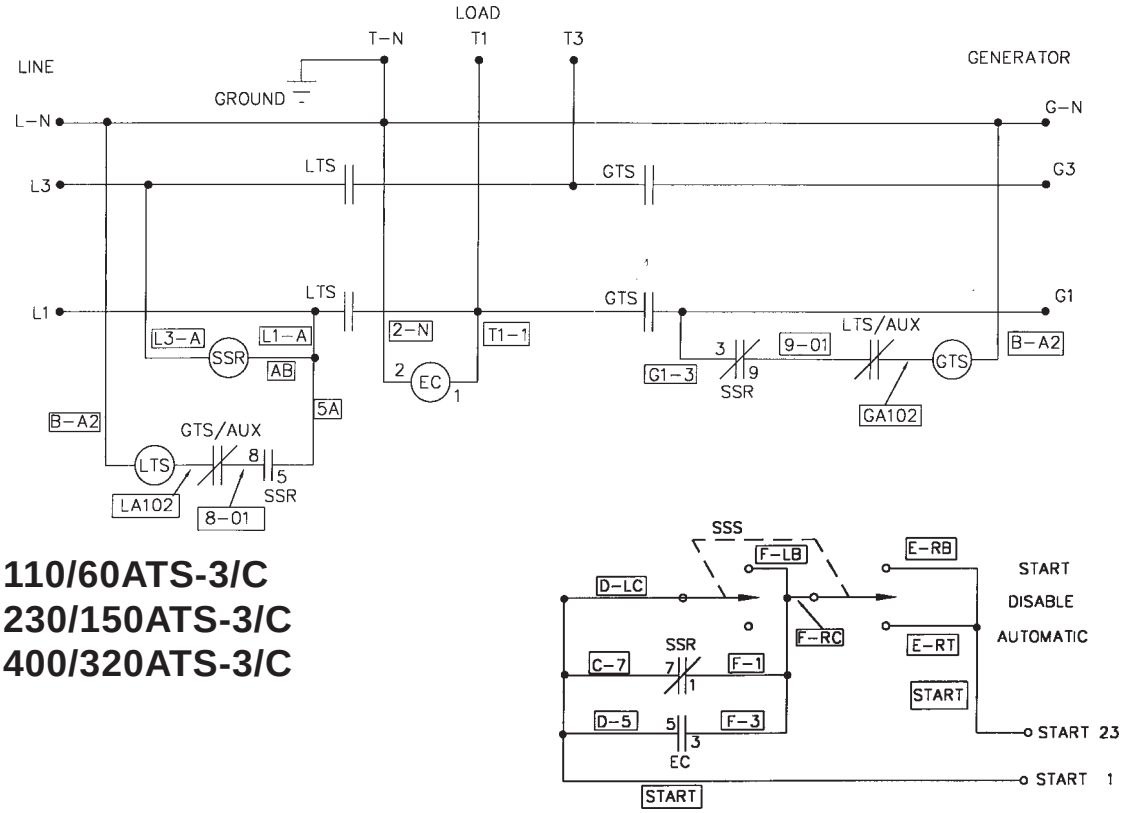
When performing any type of maintenance on this equipment make sure the selector switch on the A.T.S. is in the "disable" position. Disconnect normal power and confirm with a reliable meter that all power has been disconnected.

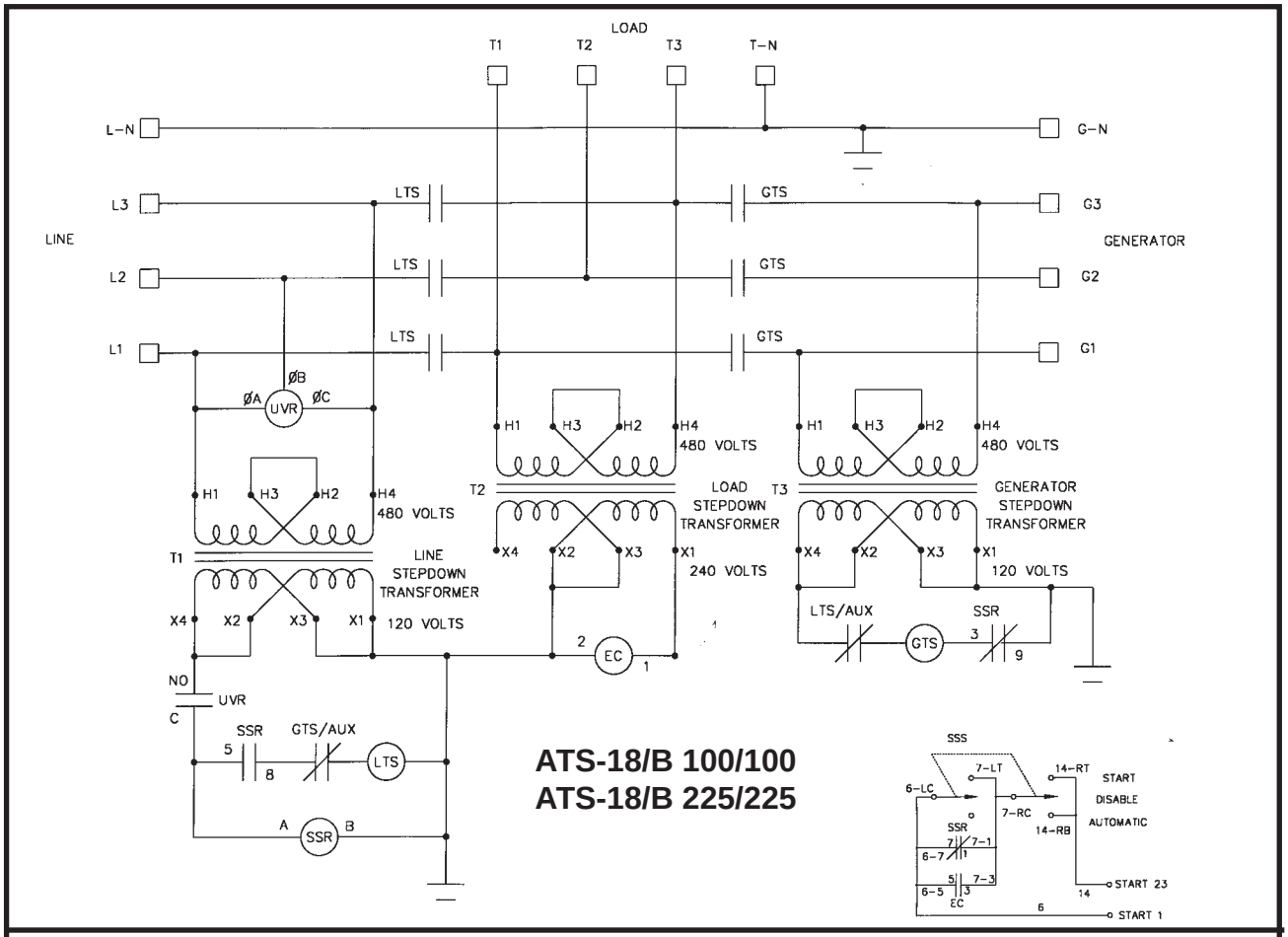
Clean and inspect the switch once a year. De-energize all power sources, both line and engine generator set, then brush and vacuum away any excessive dust and dirt accumulation. You can at this time with the contactor de-energized remove the contactor covers and check the contacts. Make sure the contacts are clean and not burned or pitted.



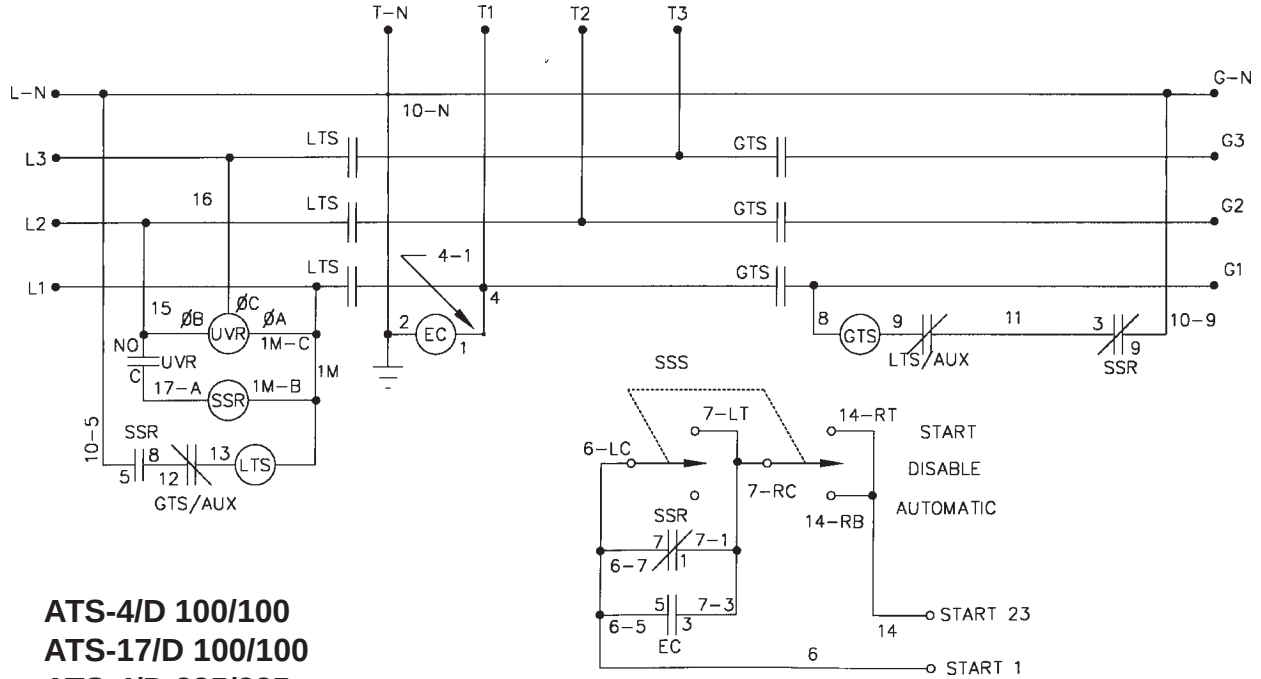
230/150ATS-4/D
230/150ATS-17/D



110/60ATS-3/C
230/150ATS-3/C
400/320ATS-3/C

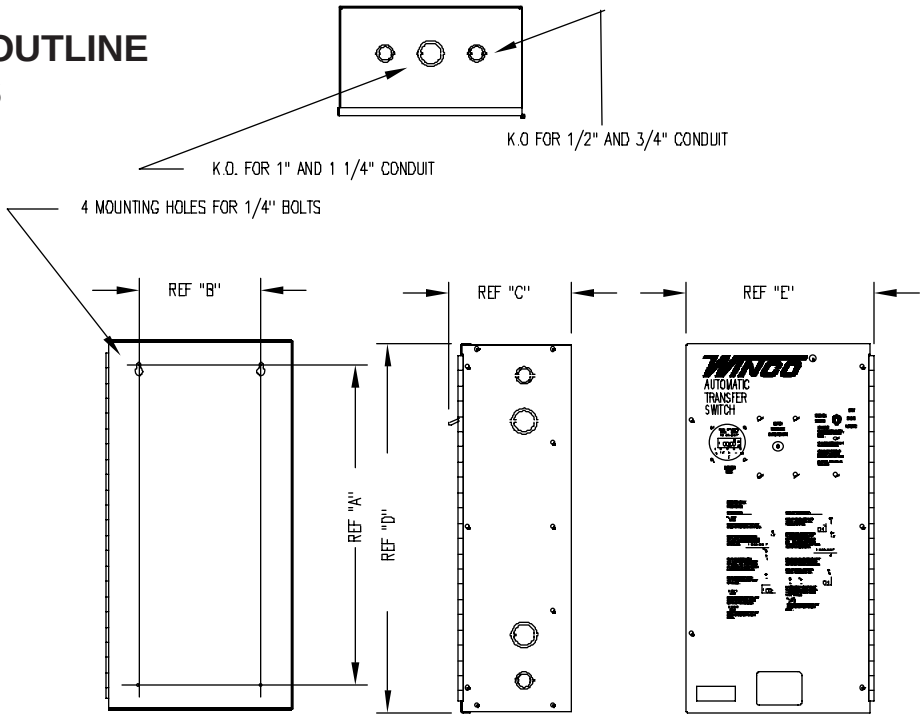


ATS-18/B 100/100
ATS-18/B 225/225



ATS-4/D 100/100
ATS-17/D 100/100
ATS-4/D 225/225
ATS-17/D 225/225
ATS-4/D 400/300
ATS-17/D 400/300

ATS PANEL OUTLINE DIMENSIONS



ATS SIZE	REF A	REF B	REF C	REF D	REF E
100/50 ATS	21.00”	8.00”	8.10”	24.25”	12.375”
100/100 ATS	22.88”	14.00”	10.63”	28.25”	18.375”
225/100 ATS	22.88”	14.00”	10.63”	28.25”	18.375”
225/225 ATS	22.88”	14.00”	10.63”	28.25”	18.375”
400/225 ATS	28.00”	16.00”	12.68”	36.00”	23.88”
400/300 ATS	28.00”	16.00”	12.68”	36.00”	23.88”
110/60 ATS	17.00”	8.00”	8.10”	20.00”	12.375”
230/150 ATS	22.90”	14.00”	10.63”	28.00”	18.375”
400/320 ATS	28.00”	16.00”	12.68”	36.00”	23.875”

WINCO INC
A Division of DTE Dyna Technology Inc

WINCO, Incorporated warrants to the original purchaser for 12 months that goods manufactured or supplied by it will be free from defects in workmanship and material, provided such goods are installed, operated and maintained in accordance with Winco written instructions.

WINCO's sole liability, and Purchaser's sole remedy for a failure under this warranty, shall be limited to the repair of the product. At WINCO's option, material found to be defective in material or workmanship under normal use and service will be repaired or replaced. For warranty service, return the product within 12 months from the date of purchase, transportation charges prepaid, to your nearest WINCO Authorized Service Center or to WINCO, Inc. at Le Center Minnesota.

THERE IS NO OTHER EXPRESS WARRANTY.

To the extent permitted by law, any and all warranties, including those of merchantability and fitness for a particular purpose, are limited to 12 months from date of purchase. In no event is WINCO liable for incidental or consequential damages.

Note: Some states do not allow limitation on the duration of implied warranty and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply in every instance. This warranty gives you specific legal rights which may vary from state to state.

WINCO reserves the right to change or improve its products without incurring any obligations to make such changes or improvement on products purchased previously.

EXCLUSIONS:

WINCO does not warrant Engines, Batteries, or Other Component Parts that are warranted by their respective manufacturers.

WINCO does not warrant modifications or alterations which were not made by WINCO, Inc.

WINCO does not warrant products which have been subjected to misuse and/or negligence or have been involved in an accident.

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