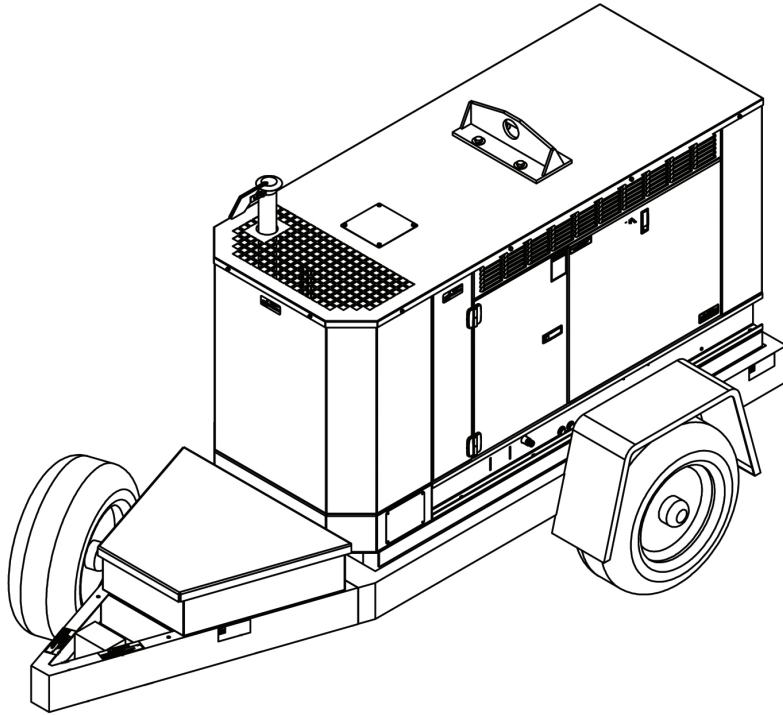




**RP25/D
GENERATORS**



INSTALLATION AND OPERATORS MANUAL

DSE 7310 MKII ELECTRIC START

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SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the generator. Read and understand all instructions in the manual before starting and operating the generator.

USING THIS MANUAL

Congratulations on your choice of a WINCO generator. You have selected a high-quality, precision-engineered generator designed and tested to give you years of satisfactory service.

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

Should you experience a problem please follow the “Troubleshooting Tables” near the end of this manual. The warranty listed in the 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 generator has the same serial number as yours. 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 NAME _____

DEALER PHONE # _____

TESTING POLICY

Before any generator is shipped from the factory, it is fully checked for performance. The generator is loaded to its full capacity, and the voltage, current, and frequency are carefully checked.

Rated output of generator is based on engineering tests of typical units, and is subject to, and limited by, the temperature, altitude, fuel, and other conditions specified by the manufacturer of applicable engines.

This unit comes factory set for either key start or manual start. With the DSE 7310 MKII controller used in the manual start option it is possible to wire the control for remote start. Wiring instructions can be found further in this manual. The key start version does not have this option.

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 potentially 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.

CALIFORNIA PROPOSITION 65



WARNING: This product contains crude oil, gasoline, diesel fuel and other petroleum products, Antifreeze to which can expose you to chemicals including toluene and benzene, Ethylene glycol (ingested) which are known to the State of California to cause cancer, birth defects or other reproductive harm and developmental issues. For more information go to www.P65Warning.ca.gov.

ANSI SAFETY DEFINITIONS

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.

WARNING:

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

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.

1. ELECTRICAL SHOCK -

The output voltage present in this equipment can cause 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-pronged 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 -

Gasoline and other fuels present a hazard of possible explosion and/or fire.

- A. Do not refuel when the engine is running or hot.
- 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 including attached garages
- 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, floors).

4. NOISE HAZARD -

Excessive noise is not only tiring, but continual exposure can lead to loss of hearing.

- A. Use hearing protection when working around this equipment for long periods of time.
- B. Keep your neighbors in mind when using 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 materials that could create a potential fire hazard.
- C. Carefully clean up any gas or oil spills before starting the unit.

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, covers, or receptacle panels while the engine is running.
- D. Use extreme caution when working on electrical components. High output voltage from this equipment can cause serious injury or death.
- E. Always avoid hot mufflers, exhaust manifolds, and engine parts. They can cause severe burns instantly.
- F. The use of the engine-generator set must comply with all national, state, and local codes.

SPECIFICATIONS

RP25

Generator				
Wattage	19,700	20,000	20,000	20,000
kVa	19.7	25	25	25
Volts	120/240	120/208	120/240	277/480
Phase	Single	Three	Three	Three
PF	1.0	.80	.80	.80
Amps	70 ⁽¹⁾	69	60	30
CB Size	70	70	70	30
Hertz	60	60	60	60

(1) Maximum current available at terminal block and cam-lock. A maximum current of 82 amps is available when the receptacle package is used.

Engine	
Model	Isuzu 4LE1
Starting System	12 Volt
Muffler	Standard
Fuel Consumption (full load)	1.8 Gal/Hr

Engine Fluid Specifications

Fuel	ASTM D-975 -1D or 2D EN590 or equivalent
Oil Type	SEE LUBRICATION SECTION
Oil Capacity	8.6 Quarts
Cooling System	50/50 mix

GENERATOR END

NOTE: Review the Stamford Newage nameplate on your generator. Some custom applications use other models. Check the generator nameplate for actual model number. Additional generator information available on line at www.wincogen.com under Service Support.

Model	Stamford PI144F1L
Winding Group	311
Resistances:	
Rotor	0.708 Ohms @22°C
Stator (L-L)	0.265 Ohms Per Ph @ 22°C
Exciter Rotor (L-L)	0.201 Ohms Per Ph @ 22°C
Exciter Stator (L-L)	20.3 Ohms @ 22°C
EBS Winding	12.9 Ohms @ 22°C
Voltage Regulator (L-L)	AS480

INTRODUCTION

PRODUCT DESCRIPTION

This engine-generator set is designed for unattended remote start operation. It can be operated as part of a fully automatic standby power system or independently as a local start unit in a prime power system. The engine-generator set is fully tested at the factory prior to shipment to insure proper operation of each individual component as well as the total system's performance and reliability.

The engine generator set consists of a multi-cylinder, liquid cooled engine nominally operating at 1800 rpm. The generator frequency regulation is maintained by the engine governor to within +/- 1.5 Hz (cps), from no load to rated load for standard mechanical governors and to within +/- .5 Hz or better for units equipped with an electronic governor. The generator is a single bearing, direct drive, rotating field design. The generator is connected to the engine flywheel via flexible drive disks. Generator set is skid mounted with isolation mounts between the engine and base on all units.

A customer supplied 12 Volt battery is required to complete the installation. Battery requirements are listed later under the battery installation section.

Unit Orientation Note: All references used in this manual for unit familiarization, access and component locations on the Generator Set are oriented from a TOP (plan) VIEW with engine at the FRONT and generator to the REAR.

WINCO uses a common junction box for all customer control and power connections (both AC output and DC control). The common electrical junction box is always on the left side at the generator end of the machine.

The engine is controlled and Generator Set operation is monitored for safe operation by a programmable microprocessor based electronic Engine Control Module (ECM) with an LCD digital display. The generator set ECM control is mounted on a vertical pedestal on the right side of the generator. The ECM is programmed with a cycle cranking sequence - 3 cycles of 15 seconds on/15 seconds off, and 5 minute cool-down delay. The cool-down delay can be changed in the field from 0 to 30 minutes by your installer. Other features, timing cycles, set points, and signal output capabilities are possible. Consult factory for procedure and passwords.

NOTICE:

These units will automatically transfer if a power outage occurs while running in exercise mode.

GENERATOR SET

Every WINCO generator set has its own unique identity data plate. This data plate identifies the complete unit model number, the system serial number, and has links to the individual components that form the generator set in our factory records. Several of the major components also have their own individual data plates providing additional information to document build data for warranty and replacement parts.

ENGINE

Refer to the engine operators manual for more detailed operation and maintenance information.

CAUTION: EQUIPMENT DAMAGE:

Be sure to check the engine oil level frequently as specified in the engine manual.

The engine manufacturer has established an excellent worldwide engine service organization; engine service is available from a nearby authorized dealer or distributor. Go to the WINCO website for a list of engine dealers (http://wincogen.com/Engine_Support) or contact the WINCO Service Department.

The rated power of each engine-generator is limited by the temperature, altitude, and all other ambient conditions specified by the engine manufacturer. Engine power may decrease 3% for each 1000 feet above sea level, and will decrease an additional 3% for each 10 degrees Fahrenheit above 60° Fahrenheit. Units should not be operated in ambient temperature greater than 122° Fahrenheit.

GENERATOR

WINCO generator sets use brushless, AVR (Auto-Voltage Regulator) controlled broad-range generator ends. The generator converts rotational mechanical energy into electrical energy. These WINCO units are equipped with generators manufactured by Cummins Generator Technology. Each generator 'end' has its own data tag. A unique serial number is on the data plate.

TRAILER/HOUSING

These switchable voltage generators are normally shipped fully enclosed & mounted on a trailer. The trailer is DOT approved and you should receive a certificate of origin. This will allow you to register the equipment and obtain tags from your state. If you should encounter any problems registering the trailer, contact the WINCO Service Dept at 507-357-6831.

PREPARING THE UNIT

UNPACKING

1. As you receive your unit, it is critical to check it for any damage. If any damage is noted, it is always easiest to refuse the shipment and let WINCO take care of the freight claim. If you sign for the unit, the transfer of the ownership requires that you file the freight claim
2. Before proceeding with the preparations of your new generator for operation, take a couple of minutes to ensure the unit you have received is the correct model and review the specification pages in this manual to ensure that this unit meets your job requirements.

CAUTION: EQUIPMENT DAMAGE:

This unit is shipped with oil and a 50/50 mix of coolant. Be sure to check all fluid levels before operating. See engine manufacturer's instruction manual for recommended oil requirements before initial starting.

Once generator set is on-site:

After inspecting the engine-generator for external, physical damage, locate and check the following items packed with the unit:

- a. Installation and Operator's Manual.
- b. Engine manufacturer's instruction manual.
- c. Battery hold-down brackets & hardware.
- d. Unit components or accessory items shipped loose for on-site installation.
- e. Optional accessories.

LIFTING THE GENERATOR SET

1. Make sure that the area under the equipment is kept clear.
2. Be certain rigging is designed to lift unit safely.
3. Never attempt to lift the unit unless you are certain the lifting device has sufficient capacity.
4. Never allow the unit to swing while suspended.
5. Be certain the supporting structure is adequate to handle the weight of the unit.

CAUTION:

Only lift the unit using the factory installed lifting eye, located on top of the unit's housing.

TOWING THE EQUIPMENT

1. Always use a vehicle capable for safe operation.
2. Never tow without the safety chains secured.
3. Always use the proper ball hitch size on the vehicle.
4. Never attempt to tow with a vehicle without side mirrors installed.

SETTING THE JACKS

1. Move the two rear jacks from transport position to run position.
2. Rotate the front jack from transport position to run position.
3. Level the unit using the three jacks before starting the unit.
4. Return jacks to transport position before moving the unit.

INSTALLATION

WARNING: PERSONAL INJURY:

PERSONAL INJURY - Before proceeding with the installation, be sure the DSE7310 MKII is in the "stop" position. Before proceeding with the installation, be sure the Generator MLCB (Main Line Circuit Breaker) is in the 'OFF' position and the unit starting battery is disconnected.

GENERAL INFORMATION

This engine-generator set is supplied as weather enclosed, trailered packages. The DOT certified trailer is required for mobile applications. Consult a qualified, licensed electrician or contractor to install and wire the gen-set. The installation must comply with all national, state, and local codes. The factory weather enclosures are acoustical housing intended for outdoor use only. Units are not intended to be used indoors and no support is available to assist in re-engineering finished packaged units.

Before beginning the installation process, recheck the voltage, phase, and amperage rating of the generator set. Be certain it can handle the intended load and are compatible with the intended loads. Plans for installation should be prepared with proper attention to mechanical and electrical engineering detail to assure a satisfactory system installation.

The information in this manual is offered only as a guide to finalizing your installation plans.

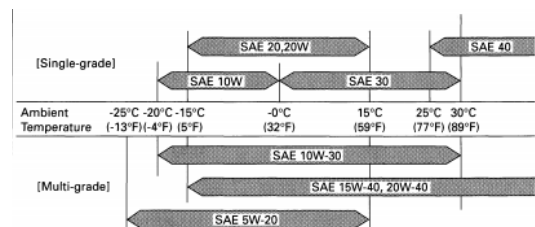
FUEL REQUIREMENTS

During periods of normal operations, the engine uses #2 diesel fuel. Seasonally blended fuel should be used during time of extreme cold to ensure proper engine operation. See the engine operator's manual for more specific information on requirements.

NOTE: When starting the unit for the time it may be necessary to prime the engine before engaging the starter. The internal tank on the unit was not used during testing so there may be some air in the fuel lines that will have to be bled out.

LUBRICATION

Before starting the engine, check the oil level in the crankcase. If it is low, refill to the full mark with the proper weight/grade of oil as recommended by the engine manufacturer's maintenance instructions. The necessity of using the correct oil, and keeping the crankcase full, cannot be over emphasized. Failure to use the proper oil and keep the crankcase properly filled will cause excessive engine wear and shorten its useful life.



COOLANT

Before starting the engine, check the coolant level in the radiator. If it is low, refill as specified in the engine manufacturer's maintenance instructions. The radiator should be filled to about 1 inch below the filler neck. For additional information on engine coolant requirements, see engine manufacturer's maintenance instructions.

INSTALLING THE BATTERY

CAUTION:

In the following battery installation procedure, check to be sure the DSE 7310 MKII is in the "stop" position. This should be your last step before initial start-up.

The RP25 is a 12 volt system and requires a single battery. The batteries should be rated at a minimum of 650 CCA. Installation of the highest CCA rated battery, within the correct BCI group, will increase cold weather starting performance. Gel batteries should not be used with the battery tender installed in the generator enclosure.

Installation and servicing of batteries must only be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

When installing or replacing batteries, use the proper group/size starting battery. The battery should be a maintenance-free lead acid design. Deep cycle batteries will not work for this application.

CAUTION: PERSONAL DANGER:

NEVER dispose a battery in a fire. The battery is capable of exploding.

DO NOT open or mutilate the battery. Released electrolyte is known to be harmful to the skin and eyes and to be very toxic.

These engine-generator sets are all NEGATIVE ground. Be very careful not to connect the battery in reverse polarity, as this may short circuit the battery charging system on the engine.

CAUTION:

A battery presents a risk of electrical shock and high short circuit current. The following precautions must be observed when working with batteries:

1. Remove watches, rings, and other metal objects.
2. Use tools with insulated handles.
3. Check both the battery cable ends and the battery posts to be sure they are free of corrosion.
4. Always connect the battery positive cable first and then connect the battery negative cable. When removing the battery cables from the battery, reverse the procedure, disconnect the negative first and then the positive cable.
5. Be sure all connections are tight and coat the terminals and cable ends with dielectric grease.

WARNING:

The electrolyte is diluted sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following precautions must always be taken.

1. Always wear full eye protection and protective clothing.
2. Where electrolyte contacts skin, wash off immediately with water.
3. If electrolyte contacts the eyes, flush thoroughly and immediately with water and seek immediate medical attention.
4. Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of one pound of bicarbonate of soda (baking soda) to one gallon of water. The bicarbonate of soda solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water and the area dried.

DANGER: EXPLOSIVE FIRE RISK:

1. Never smoke when near batteries.
2. Do not cause a flame or spark in the battery area.
3. Always discharge static electricity from your body before touching batteries by first touching a ground metal surface.

SERVICING BATTERIES

Batteries used on these units may, over time, lose water. This is especially true if you are using a trickle charger to maintain your battery. Different types of batteries require various types of maintenance. Refer to the battery manufacturer for specific recommendations.

NOTE: *Always make sure that a new battery is fully charged before installing it on a generator set. Failure to do so can cause damage to the engine control module in the generator set.*

All connections must be clean and tight. Depending on your battery type, check the electrolyte in the battery periodically to be sure it is above the plates. Never allow the battery to remain in a discharged condition.

CAUTION: EQUIPMENT DAMAGE:

Never attempt to jump start this engine. If the battery should accidentally become discharged, disconnect the battery cables and recharge the battery before attempting to start the unit. Boost/jump starting this unit improperly will result in PERMANENT DAMAGE TO THE ENGINE CONTROL MODULE (ECM).

BATTERY CHARGER & BLOCKHEATER

A three-stage electronic battery charger is provided standard on this unit. This charger has three rates of charging. During the first mode, known as Bulk charging, the charging current is limited to 2 Amps at a voltage of up to 14.5 VDC. The green LED will blink during this stage. During the Absorption mode, the charger holds the battery voltage at approximately 14.5 VDC, and then gradually reduces the amount of Amps it delivers to the battery. This way the battery is able to “absorb” the last 10% of charge as quickly as possible without becoming overheated. The green LED will blink during this stage. When the battery approaches full charge, the charger switches into its third charging stage, gradually reducing the current fed to the batteries to as low as 0.1 Amps. At the same time, it reduces its output to a “Float” or “Maintenance” charging rate of approximately 13.3 VDC nominal, indicated by the green LED. This low “Float” or Maintenance” voltage gently “tops off” the battery, keeping it fully charged and ready until needed. The green LED will indicate the battery is fully charged.

The blockheater on this unit is 1000 watts and should also be plugged in the Shore Power receptacle. The block heater is thermostatically controlled and when plugged in will maintain the engine coolant temperature between 100 and 120 degrees F.

MOUNTING THE AUTOMATIC TRANSFER SWITCH

For standby applications, an automatic transfer switch (ATS) will be necessary for automatic starting. A wall mounted ASCO 300 ATS designed for inside or outside installation. The transfer switch is UL1008 approved. A fourteen day electronic exerciser circuit is installed in the ATS as standard equipment. The ATS also contains the power failure sensing circuitry necessary to start and stop the engine generator set. The transfer switch is also equipped standard with a 3 second start delay, and a 15 second transfer delay to allow the engine to warm up before transferring the load to the generator. When the line power is restored the ATS has a 5 minute transfer delay to allow the incoming utility to stabilize before transferring back to line power and then an additional 1 minute engine cool down delay before the engine shuts down. Read and understand the ATS owners manual before installing, servicing or operating the transfer switch.

WARNING: FIRE HAZARD:

All wiring must be done by a licensed electrician, and must conform to the National Electrical Code and comply with all the local codes and regulations. Check with the local authorities before proceeding.

INSTALLATION NOTES:

Because of many different types of service, feeder and distribution equipment, no specific wiring instructions can be provided. It is 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 ATS Control and safety system will eliminate all paths and feedback.

To wire the automatic transfer switch into existing wiring, first determine which circuits will be on the emergency load circuit. If the entire load is transferred, the transfer switch can be wired directly after the watt-hour

meter and the service entrance, providing the service entrance ampere rating is within the transfer switch's rated capability.

If only specific circuits are to be powered under emergency 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 installed in the emergency distribution panel. The ATS is then installed between the main panel and 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.

ELECTRICAL CONNECTIONS

NOTICE: CLASS 1 WIRING METHODS ARE TO BE USED FOR ALL FIELD WIRING CONNECTIONS TO TERMINALS OF A CLASS 2 CIRCUIT

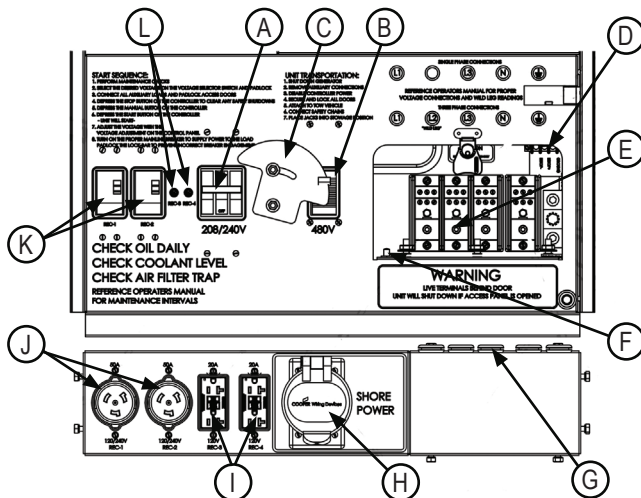
All wiring must be completed in accordance with the National Electric Code as well as any state and local codes.

You must pay particular attention to wire size requirement for the amperage of service you are dealing with. The table below provides you guidance on wire sizing based on both wire type and amperage. **Wire amperages have been derated for 40° C ambient temperatures operation.**

WARNING:

Make sure the generator is disconnected from the battery to prevent accidental starting.

RECEPTACLE PANEL



A: 208/240 VOLT MAINLINE CIRCUIT BREAKER:

This is the low voltage mainline circuit breaker feeding the full output terminal block. This circuit breaker is used when the selector switch is in the 120/208V 3-PH, 120/240V 3-PH, or 120/240V 1-PH switch position.

B: 480 VOLT MAINLINE CIRCUIT BREAKER:

This is the high voltage mainline circuit breaker feeding the full output terminal block. This circuit breaker is used when the selector switch is in the 277/480V 3-PH position.

C: CIRCUIT BREAKER LOCKING BAR:

Select and turn on either the high voltage breaker (480V) or the low voltage breaker (208/240V), depending on which position you have the selector switch in. This bar prevents both breakers from being turned on at the same time.

D: REMOTE START/E-STOP TERMINAL BLOCK

This terminal block provides the customer two different connections. Torque screws to 9.6 in. lb. using 14 to 16 AWG copper wire with lugs. See D.C. Electrical Connections in this manual.

E: FULL POWER OUTPUT & NEUTRAL TERMINAL BLOCK :

See A.C. Electrical Connections in this manual.

F: DOOR SAFETY SWITCH:

This safety switch is connected to the DSE 7310 MKII engine control and will shut the unit down any time door is opened with the unit running. This prevents someone from accidentally contacting the main power connection with the unit running. This unit will not start if the door is not closed and latched.

G: WIRE ENTRANCE HOLES:

These hole have been specifically provided for you to route your full power leads through to the output lugs. The routing holes were provided to insure that no small child or curious adult can reach inside and come into contact with the main output lugs with the unit running.

H: 120V 20 AMP 3-WIRE RECESSED SHORE POWER PLUG:

NEMA Spec 5-20. This panel mounted plug is designed to plug directly in a standard 20 amp receptacle on a extension cord. The plug when connected will provide power to the block heater and the battery trickle charger mounted inside the generator enclosure. This can be used when the set is used in a standby application to keep the engine warm and the battery charged or in your rental yard to keep the battery charged up. This receptacle is to be powered by a GFCI circuit and installed in accordance with the United States National Electric Code.

I: 2 - 120V 20 AMP GROUND FAULT INTERRUPTER DUPLEX:

These duplex receptacles are protected by 20 amp circuit breakers mounted just above the duplexes. The "T" slot design both 15 and 20 amp 120V cords can be plugged in.

J: 2- 120/240V 50 AMP 4-WIRE TWISTLOCK:

These receptacles are rated for dual voltage, 120 or 240V use. It is a 4-wire receptacle, with a center grounding pin. 4-wire drop cords plugged into this receptacle may be split into 120V receptacles at a distrobution box. Each receptacle is protected by a two pole 50 amp circuit breaker mounted just above it. THIS RECEPTACLE UTILIZES A HUBBLL PLUG PART # CS6365.

K: 250V 50 AMP CIRCUIT BREAKERS:

These circuit breakers protect the 2 - 50 amp twistlock receptacles (H).

L: 120V 20 AMP CIRCUIT BREAKERS:

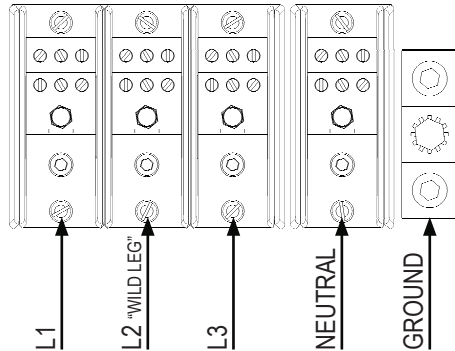
These two push button 20 amp circuit breakers protect the two GFCI receptacles (G).

WARNING:

A mainline circuit breaker has been provided inside the generator housing. During all wiring installations, make sure the breaker is in the OFF position and the generator operating switch is in the OFF position.

A.C. ELECTRICAL CONNECTIONS

This AC terminal block is covered by a lockable access cover. Access for routing the wires into the terminal block is provided via a small access door just to the left of the main control panel door. You will also find your convenience receptacles located behind this small door. All receptacles located here have their own circuit breaker for protection.



NEUTRAL LUGS:

These lugs are isolated from ground and provided for you to connect your neutral wire from the transfer switch to the generator. Lugs will handle up to 2/0 wire. Torque lugs to 150 in. lbs. using #1 and #2 wire and 180 in. lbs. for 1/0 & 2/0 wire.

GROUND LUG:

These ground lugs are bonded to ground and are provided for you to connect your ground wire from the transfer switch to. The lugs will accommodate up to 2/0 wire. Torque lugs to 150 in. lbs. using #1 & #2 wire and 180 in. lbs. for 1/0 & 2/0 wire.

L1, L2, & L3 POWER OUTPUT LUGS:

The full power terminal block is capable of handling full generator output at any of the selected voltages. For single phase 120/240 connect to L1 and L3, the third leg L2 is not powered or used. Lugs will handle up to 2/0 wire. Torque lugs to 150 in. lbs. using #1 & #2 wire and 180 in. lbs. for 1/0 & 2/0 wire. In the 120/240V 3-Ph configuration with the wild leg (208 line to neutral) is wired to the L2 position.

WARNING: PERSONAL DANGER:

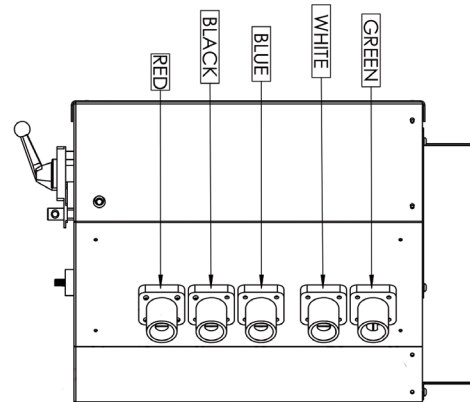
This unit is shipped with the neutral and ground unbonded. If the unit is to be used as a stand-alone generator, you must bond neutral and ground together either at this terminal block or somewhere in your system.

GROUNDING

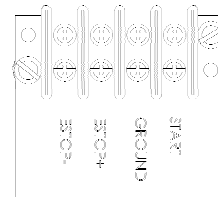
A grounding lug has been provided on the engine generator set and the generator set must be properly grounded to good earth ground. Generally an 8 foot copper rod driven into the earth will provide a proper earth ground.

CAM-LOCK CONNECTIONS

This unit is equipped with Com-Lock connector, located behind the rear, right door panel. These Cam-Locks are connected to the full load terminal blocks and are capable of providing full generator output in all voltage configurations. The mating connectors are model CL2FB, which are available with different wire size capabilities.



D.C. ELECTRICAL CONNECTIONS



All DC connections are completed on the terminal strip just below the engine control. All DC connection must be separate conduit. You cannot mix AC and DC leads at the same conduit.

CUSTOMER REMOTE START CONNECTIONS TERMINALS. This can be either an automatic transfer switch or just a remote switch in a job trailer. This feature requires a relay closure between the two connections on the terminal block to put the unit into an auto-start mode. The auto-start mode has both a start delay and a cool down delay built into the DSE 7310 MKII

Torque Screws to 9.6 in. lb. using 14 to 16 awg copper wire with lugs.

Note: Any relay closure can be used to start and stop this generator. As long as the contact stays closed the engine generator set will continue to run. Once the relay is opened the unit will shut down and remain in the standby mode until the remote start relay is closed again.

ESTOP- & ESTOP+. Remote Emergency Stop terminals. These two terminals are shipped with a jumper installed. If your application requires the installation of a Remote Emergency Stop switch, remove the jumper and wire your switch to these terminals. This unit will not start and run without either the jumper installed or a remote N/C switch installed.

DC INTERCONNECTIONS TO THE ATS

WARNING:

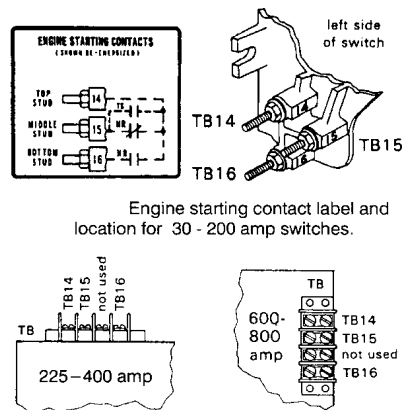
Be sure Engine/Generator is in the OFF position before you make any DC interconnections.

CAUTION:

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

ASCO 300 UL SWITCH

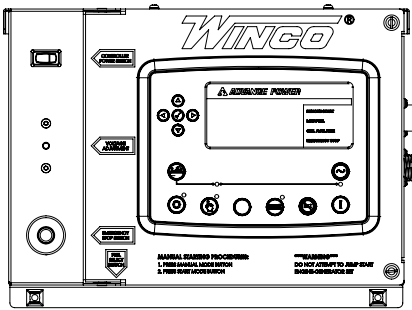
Your DC connection points in the ASCO 300 ATS terminals “14” and “15”. Depending on the size of the switch, they are located in different locations.



Your DC connection points in the ASCO 300 ATS are terminals “14” and “15”. Depending on the size of the switch they are located in different locations.

STARTING PROCEDURE

CONTROL LAYOUT



	STOP/RESET - This button places the module into its Stop/Reset mode. This will clear any alarm conditions for which the triggering criteria have been removed. The fuel supply de-energizes and the engine comes to a standstill. Should a remote start signal be present while operating in this mode, a remote start WILL NOT occur.
	MANUAL MODE - This button places the module into its Manual Mode. Once in Manual Mode, the model responds to the Start button to start the generator and run it off load.
	START - Pressing this button from STOP/RESET will start the engine and run the load.
	AUTO MODE - This button places the module into its Auto Mode. This mode allows the module to control the function of the generator automatically.
	ALARM/LAMP TEST - This button silences the audible alarm in the controller, de-activates the Audible Alarm output (if configured) and illuminates all of the LEDs on the module's face as a lamp test function.
	MENU NAVIGATION - Used for navigating the instrumentation, event log, and configuration screens.

PROTECTIONS

When an alarm is present, the common alarm LED if configures will illuminate. The LCD display will show an icon to indicate the failure.

WARNINGS

Warnings are non-critical alarm conditions and do not affect the operation of the generator system, they serve to draw the operator's attention to an undesirable condition. Warning alarms are self-resetting when the fault condition is removed. The icon will appear steady in the display.

SHUTDOWNS

Shutdowns are critical alarm conditions that stop the engine and draw the operator's attention to an undesirable condition. Shutdown alarms are latching. The fault must be removed and the STOP/RESET button pressed to reset the module. The icon will be flashing in the display.

SELECTING THE CORRECT VOLTAGE

A variety of phase voltages are available from the four position selector switch. The four basic connection patterns are Delta (120/240). Low or Parallel Wye (120/208), High Wye (277/480), and Single Phase 120/240.

The table below show the voltages at the terminal lug as well as the receptacles for all four voltage patterns available through the selector switch.

VOLTAGE SELECTOR SWITCH POSITION	TERMINALS	MINIMUM VOLTAGE	NORMAL VOLTAGE	MAXIMUM VOLTAGE
120/240V SINGLE PHASE				
LINE TO LINE	L1 TO L3	220	240	260
120/240V RECEPTACLES		110/220	120/240	130/260
LINE TO NEUTRAL	L1 TO N	110	120	130
	L2 TO N	-0-	-0-	-0-
	L3 TO N	110	120	130
120V RECEPTACLES		110	120	130
120/208V THREE PHASE				
LINE TO LINE	ALL	200	208	220
120/240V RECEPTACLES		110/200	120/208	127/220
LINE TO NEUTRAL	ALL	115	120	127
120V RECEPTACLES	ALL	115	120	127
	G3 TO N	115	120	127
120/240V THREE PHASE				
LINE TO LINE	ALL	220	240	260
120/240V RECEPTACLES		110/220	120/240	130/260
LINE TO NEUTRAL <small>USE CAUTION THIS CONFIGURATION HAS A HIGH VOLTAGE LEG</small>	G1 TO N	110	120	130
(HIGH VOLTAGE LEG)	G2 TO N	191	208	225
	G3 TO N	110	120	130
120V RECEPTACLES		110	120	130
277/480V THREE PHASE				
LINE TO LINE	ALL	416	460	480
120/240V RECEPTACLES		NONE	NONE	NONE
LINE TO NEUTRAL	ALL	240	265	277
120V RECEPTACLES		NONE	NONE	NONE

WARNING: POTENTIAL EQUIPMENT DAMAGE

The 120/240V three phase position has a wild leg that produces 208V line to neutral on G2. Be sure when connecting to your panel or load, that you match the wild phase on the generator to the wild phase in your panel or load. failure to do so will result in 120V devices receiving 208V. You must also match your rotation.

Before wiring and starting this unit, be sure you have the selector switch set for the right voltage. You must depress the safety switch below the selector switch to change the position of the voltage selector switch. If the unit is running, depressing this switch will shutdown the engine-generator set.

At the same time you are making the voltage selection, you must also adjust the setting on the mainline circuit breaker to give the proper breaker protection. If you have any doubts as to the voltage in your area compare your incoming power or load name plates.

INITIAL START UP

WARNING: EQUIPMENT DAMAGE:

Before attempting to start this unit, complete your pre-start checklist and ensure the generator mainline circuit breaker is in the proper position prior to starting. Starting this unit without it properly connected can cause serious personal injury or equipment damage.

DO NOT jump start these engine-generator sets. Starting these units on a low battery or jump starting them will cause damage to the engine control module.

Use the following check list to verify correct installation before starting the engine.

- ☐ Engine oil. Fill as required with proper grade/qty.
- ☐ Engine coolant. Fill as required with proper mixture.
- ☐ Unit mounting base properly bolted down.
- ☐ Clearance for service and maintenance on all sides.
- ☐ Proper fuel line material and size.
- ☐ All fuel line connections tight.
- ☐ Battery connections clean and tight
- ☐ Battery fully charged.
- ☐ All AC and DC wiring installed and properly protected.

After completing the previous checklist, the engine-generator set is ready for initial start-up.

MANUAL MODE

1. Select the desired voltage with the selector switch.
2. Turn off both main line circuit breakers.
3. Press and release the MANUAL MODE button. The small LED light next to it should come on.
- 4.. Press and release the green START ENGINE button. The DSE 7310 MKII will send a start signal to the glow plug solenoid on the engine. Preheating the engine for about 10 seconds at the end of that time will engage the fuel rack solenoid and the starter. This will start the cranking cycle (10 seconds on and 10 seconds off).

Note: There is no start delay in this mode of operation.

If the engine fails to start during this cranking period, the starter motor is disengaged and goes into a rest mode after which a second attempt is made to start the engine. Should this sequence continue through 3 cranking cycles the start sequence will be stopped and the display will show 'FAILED TO START'.

All engine functions are controlled by the DSE 7310 MKII controller. Once the unit is running, the control will display the engine information, To get the generator information, scroll down on the controller.

The AC output readings displayed on the DSE 7310 MKII are collected through the AC interface harness wired in the generator control box. Any shutdowns related to the AC output are a function of the controller are based on information collected in the DSE 7310 MKII via this AC harness.

5. After the engine is running at the proper speed, adjust the voltage to the desired level using the external voltage trim rheostat.
6. Turn on the proper main line breaker (either high or low voltage) and padlock the lock bar to prevent the incorrect breaker from being turned on.

WARNING: EQUIPMENT DAMAGE:

Never apply a load to the generator until you have first checked the voltage at the terminal blocks or Cam-Locks.

7. With the engine running smoothly check the no load voltage and frequency on the digital display. The voltage should be 208/240/480 AC depending on which model you have and a frequency of 59.5 to 60.5 hertz (Hz).

If you have the proper voltage at the generator the next step is to check the voltage at the generator terminals. The voltage between the L1, L2, and L3 terminals should be the same as it was on the generator front panel. The voltage should also be checked between the hot terminals (L1, L2, and L3) and the N to be certain of a balanced voltage output and a solid neutral connection.

ON 240 VOLT (DELTA) SYSTEMS BE SURE YOU KNOW WHERE THE HIGH VOLTAGE "WILD" LEG IS. IT MUST BE IN THE SAME LOCATION ON THE LINE SIDE AS IT IS ON THE GENERATOR SIDE.

NOTICE:

If for any reason during the check out procedure the voltage and frequency are not correct, depress the STOP/RESET button and correct the trouble before proceeding.

8. Stopping - There are two ways to stop the unit when it is in the manual mode. Pressing the STOP/RESET button will stop the unit immediately. Pressing the AUTO mode button will stop the unit but only after the cool down timers have timed out and there is no remote start signal being sent to the unit.

AUTO MODE

1. Complete the previous Manual Mode starting procedure to ensure the system is set up properly.

2. Ensure the engine is in the OFF position during installation of the remote start connections.

3. Locate the remote start terminal block. This terminal block is located next to the full power connections, behind the access door on the control panel.

4. Locate the remote start terminals in your remote automatic transfer switch (ATS). The RP25 requires a contact closure for start.

WARNING: EQUIPMENT DAMAGE:

The remote "signal" must be a "dry" (non-powered) contact closure. Using a power contact will cause permanent damage to the engine control module.

5. For most installations, 16 gauge wire is sufficient to handle the control signal. On extremely long runs, increase the wire size to minimum voltage drop.

6. Locate and identify the "neutral" and "generator" connections in the ATS.

8. Connect the load block to the transfer switch using the proper wire sizes. Refer to the National Electric Code Handbook (NFPA 70) for proper wire type and sizing. Use Table 310-16 for wiring run through conduit and table 310-17 for free air wiring.

Use extreme caution when installing the delta voltage pattern. One power leg of this 3-phase pattern produces 208V measured from line to neutral. Be sure to match the location of the generator wild leg to the location of the wild leg on the incoming power service. Failure to do so will cause equipment damage to any 120V load incorrectly connected to this line.

9. Connect the neutral to the transfer switch using the same size wire.

10. For isolated neutral operation, remove the jumper wire between the ground lug and the neutral connection block. Then route a ground lead back to system ground.

11. Ground the generator with an eight foot copper ground rod or other approved grounding system. Connect #4 AWG copper cable from the ground lug on the generator to the ground rod.

12. Depress the RUN button on the RP25 control panel to start it.

13. Check the voltage at the ATS. Verify that it matches the incoming power line voltage line-to-line and line-to-neutral on each leg.

14. Check the three phase rotation pattern. Ensure that you have the same rotation, with both the generator and the normal power source.

15. Depress the STOP button on the front of the engine control. Let the unit stop and depress the AUTO button. The unit is now in AUTOMATIC mode. Also be sure the AUTO light is lit on the control, letting you know it is in auto mode. See control panel layout for additional information.

16. To test the Automatic Transfer Switch, follow the instruction on the operator's manual that came with the transfer switch. If you get a fault during the initial start up or prior to start up, it is most likely a false warning light. Simply reset the ATS start over.

17. Once you have completed testing of the ATS, be sure you ALWAYS leave the system in the standby mode, unless servicing the unit. For standby operation, press the AUTO button on the front of the control. The green light should light up next to the AUTO button.

NOTE: For setting the exerciser circuit, for all ATS, see the operator's manual shipped with the ATS.

CONNECTING THE LOADS

WARNING:

All wiring must be done in accordance with National Electric Code NFPA 70.

There are three ways the loads may be connected to the RP25:

1. Front Panel -

A variety of receptacles have been provided for your convenience on the front panel. The 120V receptacles are powered when the voltage selector switch is in the 120/240 single phase, 120/40V three phase, and 120/208V three phase position. The 240V receptacles are only usable in the 120/240V single phase and 120/240V three phase position. In the 120/208V position, the 240V receptacles have only 208V at them. Refer to the voltage output table, located previously in this manual.

2. Full Power Load Connection Terminal Block -

For remote connections and connecting load distribution boxes, heavy duty terminal blocks have been provided. These terminal blocks are located on the rear of the unit just below the DSE7310 MKII controller. The neutral and ground are connected together at this panel. For use with an isolated neutral, remove the jumper strap between the neutral connection block and the ground lug. This will isolate the neutral from the ground and allow you a single point grounding at a distribution panel. When using these terminal blocks, be sure to use wire rated large enough to carry your full load or the full rated load of the generator.

3. Full Power Cam-Lock Connections -

For ease of connecting and disconnecting loads, these units have been equipped with Cam-Locks located behind the right hand, rear door. See the Cam-Lock Connections in this manual. Instructions for the Full Power load Connection Terminal Block apply for the Cam-Locks. If you need to run an isolated neutral system, the jumper between the neutral and ground must be removed at the terminal block.

4. Grounding The Unit -

To comply with current safety standards, this generator set must be properly grounded. Ground the RP25 by driving an eight foot copper ground rod into the earth. Then connect a #4AWG ground cable from the grounding lug on the generator to the ground rod.

50 CYCLE OPERATION

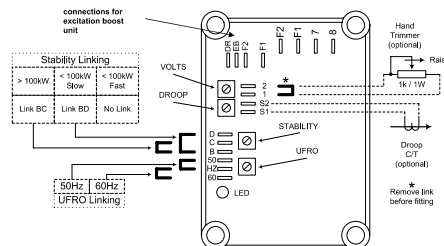
With a couple of minor changes, these mobile diesel generators are capable of producing 50Hz power. Two changes must be made:

1. The engine must be reduced to 1500 RPM governed speed.
Consult your local Isuzu service center for the proper procedure for reducing engine speed and setting up the governor to operate at 1500 RPM.
2. The automatic Volt/Hz regulator must be also reset to operate at 50 Hz. Refer to the Stamford generator manual for instructions.

VOLTAGE REGULATOR WIRING

AS440 Automatic Voltage Regulator

The following is a list of connections on the AVR. These have been factory set and other than voltage adjustment, should never be changed.



VOLTS

To adjust generator output voltage.
Clockwise to increase voltage.

STABILITY

To prevent voltage hunting.
Clockwise to increase the dampening effect.

STANDARD CONNECTIONS

Terminals 1 & 2 will be fitted with a shorting link if no hand trimmer is required.

Terminals La & Lb are linked only for special low voltage applications.

UFRO - Under Frequency Roll Off

Terminal S1 is connected to the C.T., S2 on the AVR.

DROOP - Normally preset in the works to give 5% voltage droop at full load zero power factor.

Terminal A1 is connected to the AVR 0 Volts. Positive on A2 increases excitation, negative on A2 decreases excitation.

TRIM - allows the user to adjust the sensitivity of the input.

LED Indicator Light - indicates over excitation condition or under speed running.

MAINTENANCE

The ultimate aim of a preventive maintenance program is to maintain the equipment in optimum condition, for the maximum amount of time during it's useful life. The detection of faults before they develop into major problems will decrease downtime. A regular schedule of cleaning and inspection will help assure trouble-free operation. Personnel responsible for maintenance should set up a schedule for inspection, and cleaning at intervals calculated to keep the equipment in good condition. In making up a schedule, keep the following in mind:

A. New equipment must be carefully monitored until extended operation has demonstrated that it is performing satisfactorily.

B. Old equipment requires more frequent inspection (and possibly servicing) than similar equipment that has lower hours.

C. Time spent in cleaning, inspecting and correcting minor defects before they become major troubles saves time in overhaul and repair.

MAINTENANCE SCHEDULE

SERVICE	INTERVALS
Check Engine Oil Level	Daily
Check Coolant Level and for Leakage	Daily
Check Air Filter	Daily
Check Electrolyte Level in Battery and Clean Terminals	6 Months
Drain Water from Fuel Pre-Filter	150 Hours
Check Belts and Belt Tension	300 Hours
Check Oil Vapor Filter	300 Hours
Change Oil	600 Hours
Change Oil Filters	600 Hours
Change Fuel Filters	600 Hours
Change Fuel Prefilter	600 Hours
Check Exhaust System for Damage	6 Months
Clean Fuel Tank	6 Months
Change Auxiliary Member Belt	1200 Hours
Change Air Filter (depending on conditions)	1200 Hours
Change Coolant	1200 Hours
Change Oil Vapor Filter	2 Years
Clean Turbocharger	1200 Hours
Adjust Play in Valve-Rocker Arms and Pump-Rocker Arms	1200 Hours

* There are additional maintenance items and explanations in the engine operator's manual. Read thoroughly before operating this unit.

TROUBLESHOOTING TABLE

NOTE: Before doing any trouble shooting, check the digital display on the DSE 7310 MKII. Normally, it will tell why the unit has failed. This will shorten your trouble shooting time and in many cases, prevent the replacement of parts that may not be defective.

Problem	Possible Causes
Unit will not crank when power fails	Digital genset not in AUTO Transfer control switch not in AUTOMATIC position Incorrect wiring between ATS and genset Defective control relay in ATS Fuse(s) blown in the DSE 7310 MKII Defective DSE 7310 MKII Loose or dirty battery terminals Defective starter Defective start solenoid Low/dead battery
Engine won't crank	Low/dead battery Blown DC fuses Defective DSE 7310 MKII Defective key switch Loose or dirty battery terminals Defective starter Defective start solenoid Locked up engine genset Defective engine harness Improper battery voltage to start solenoid, fuel pump, or fuel solenoid
Engine cranks but will not start	Improper fuel delivery to the unit Fuel supply shut off Fuel tank empty Air in the fuel system Engine fuel solenoid has not opened Defective fuel pump Defective fuel solenoid Defective engine harness Improper battery voltage to fuel pump or fuel solenoid
Engine starts, then stops and alarm light comes on	Engine oil pressure is low Engine has high water temperature Engine has overspeed Engine has gone into overcrank No output from AC generator Loss of speed signal Loss of run signal
Engine will not come up to speed after it starts	Insufficient fuel volume getting to the unit 1. Too small of fuel line 2. Fuel racks not open properly Governor is defective AC short in generator components
ATS will not transfer to Emergency Supply (generator)	No AC generator output Defective ATS control board. See ATS manual Circuit breaker open or defective
ATS will not re-transfer to normal power	Proper power line not available at line terminals in ATS panel Defective ATS control board. See ATS manual
No AC output from generator	Defective diode Defective voltage regulator Defective rotor Defective stator Defective exciter rotor Defective exciter stator AC short in the output leads Defective/open generator output breaker Wiring error

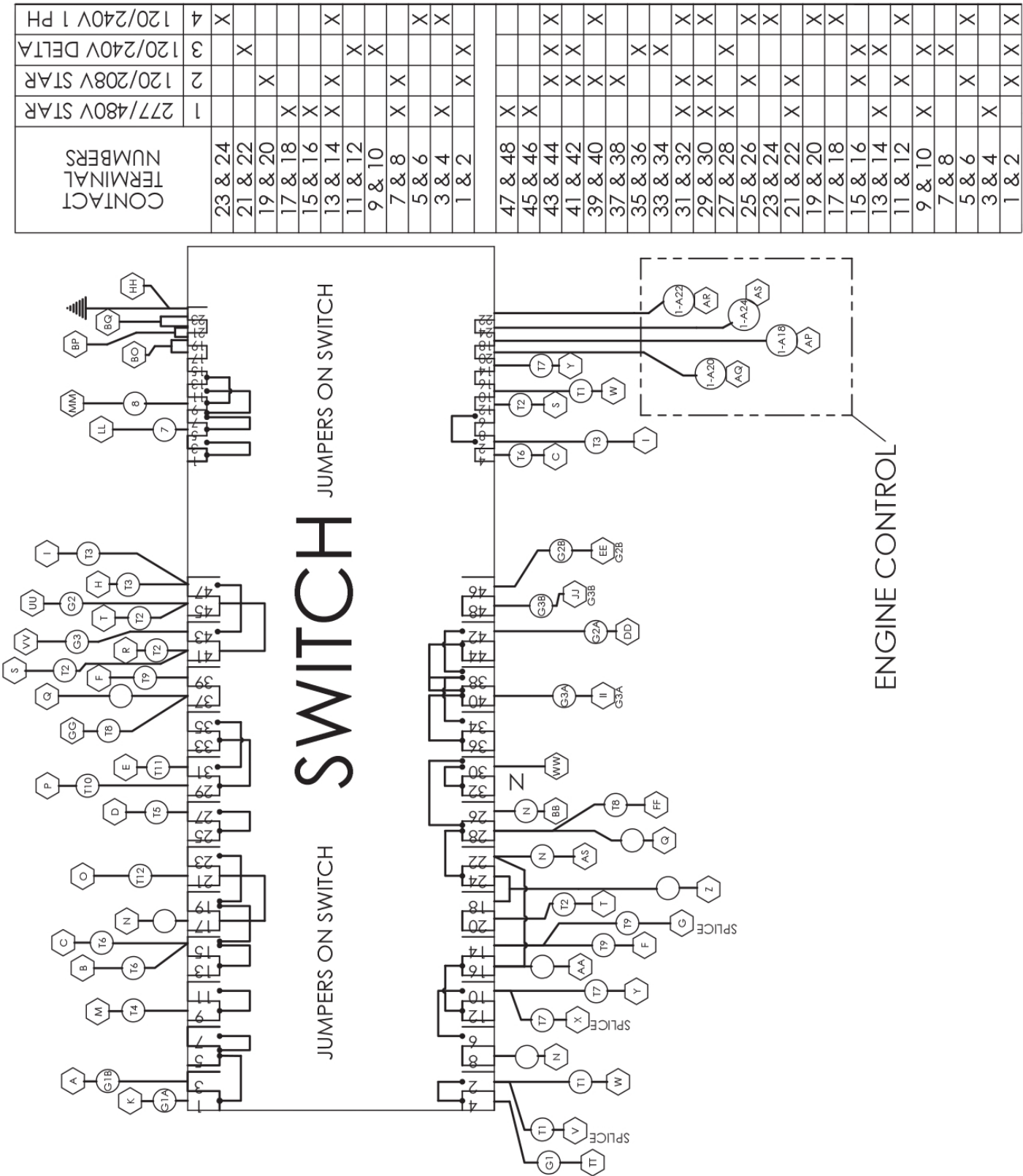
WIRING SIZE TABLE

The table below is based on Table 310.15 (B) (16) un the National Electric Code 2014 edition. Allowable ampacities of insulated conductors rated 0 through 2000V, 75°C through 90°C. Not more than three current-carrying conductors in Raceway, Cable, or Earth (direct buried). Adjust for 40°C (104°F) ambient temperature.

Copper 75°C	Copper 90°C		Aluminum Copper Clad Aluminum 75°C	Aluminum Copper Clad Aluminum 90°
Wire Type: RHW, THHW, THW, THWN, XHHW, USE, ZW	Wire Type: TBS, SA, SIS, FEP, FEPB, MI, RHH, RHW-2, THHN, THHW, THW-2, XHH, XHHW, XHHW-2, ZW-2	SIZE AWG OR KCMIL	Wire Type: RHW, THHW, THW, THWN, XHHW, USE	Wire Type: TBS, SA, SIS, THHN, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, ZW-2
44	50	8	35	41
57	68	6	44	55
75	86	4	57	68
88	100	3	66	77
101	118	2	79	91
114	137	1	88	105
132	155	1/0	106	123
154	177	2/0	119	137
176	205	3/0	136	159
202	237	4/0	158	187
224	264	250	180	209
251	291	300	202	232
273	319	350	220	255
295	346	400	238	278
334	391	500	273	319
370	432	600	299	350
405	473	700	330	382
418	487	750	339	396
431	505	800	348	410
458	532	900	374	437
480	560	1000	392	455
519	605	1250	427	496
550	642	1500	458	532
572	669	1750	480	560
585	683	2000	493	573

For additional information, see table 310.15 of the National Electric Code.

SELECTOR SWITCH WIRING DIAGRAM

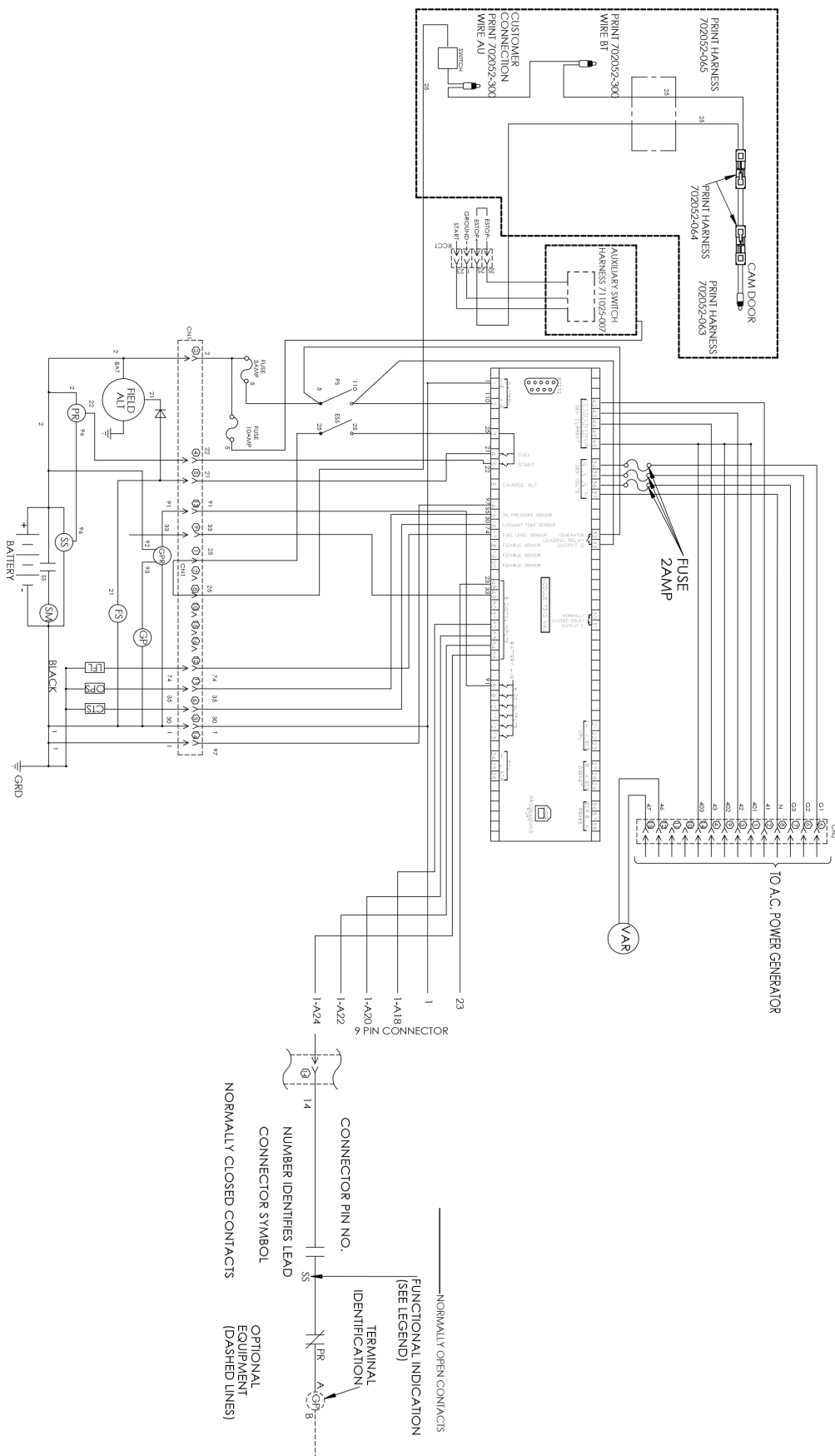


SEE FOLLOWING PAGE FOR REFERENCES

SELECTOR SWITCH WIRING DIAGRAM

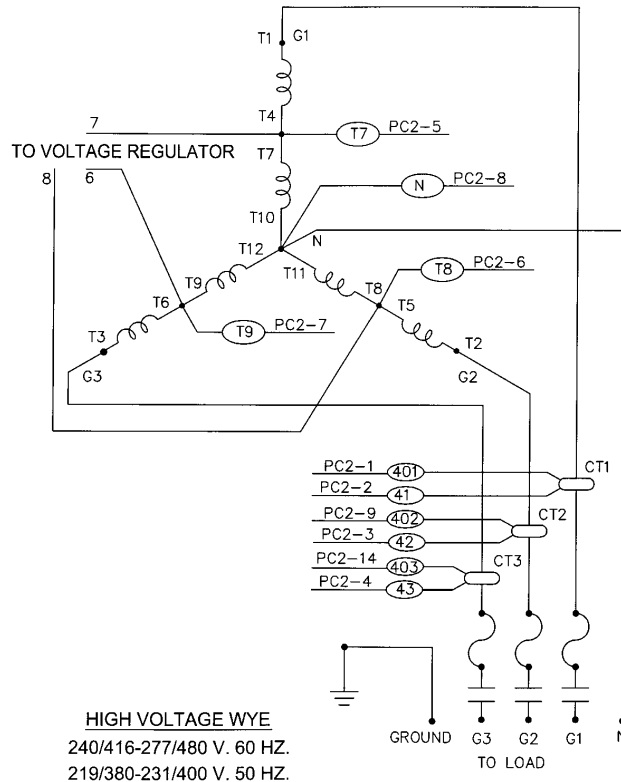
ITEM	LEAD WIRE				"A" END				"B" END				NOTES
	PART	GA	COLOR	L (IN)	ID	STRIP	LUG	POINT	STRIP	LUG	POINT		
A	91780-000	8	BLACK	32	G18	1/2	21114-000	VSS MAIN TERM #3 (RUN THROUGH CT #1)	1/2	NONE	30A 480V CIRCUIT BREAKER RIGHT TOP TERMINAL	VSS=VOLTAGE SELECTOR SWITCH	
B	91780-000	8	BLACK	36	T6	1/2	21114-000	VSS MAIN TERM #15	1/2	91320-003	GENERATOR TERM W2/T6 NON BLOCK POSITION OPPOSITE 'N'	FINAL ASSY CONNECTION	
C	10468-000	16	BLACK	12	T6	3/8	4158-000	VSS MAIN TERM #15	1/4	22370-006	VSS AUX SWITCH TERMINAL #4		
D	91780-000	8	BLACK	36	T5	1/2	21114-000	VSS MAIN TERM #27	1/2	91320-003	GENERATOR TERM V2/T5 BLOCK POSITION OPPOSITE 'W'	FINAL ASSY CONNECTION	
E	91780-000	8	BLACK	36	T11	1/2	21114-000	VSS MAIN TERM #31	1/2	91320-003	GENERATOR TERM V6/T11 ON BLOCK POSITION 'N'	FINAL ASSY CONNECTION	
F	91780-000	8	BLACK	11	T9	1/2	21114-000	VSS MAIN TERM #39	1/2	21114-000	VSS TERMINAL #14		
G	91780-000	8	BLACK	36	T9	1/2	91320-003	SPLICE TO GENERATOR TERM W5/T9	1/2	21114-000	VSS TERMINAL #14	FINAL ASSY CONNECTION	
H	91780-000	8	BLACK	36	T3	1/2	21114-000	VSS MAIN TERM #47	1/2	91320-003	GENERATOR TERM W1/T3 ON BLOCK POSITION OPPOSITE 'V'	FINAL ASSY CONNECTION	
I	10468-000	16	BLACK	11	T3	3/8	4158-000	VSS MAIN TERM #47	1/4	22370-006	VSS AUX SWITCH TERMINAL #2		
J	91780-000	8	BLACK	36	GRD	5/8	NONE	CONTROL PANEL GROUND	1/2	91320-003	GEN END GROUND	FINAL ASSY CONNECTION	
K	91780-000	8	BLACK	36	G1A	1/2	21114-000	VSS MAIN TERM #1 (RUN THROUGH CT #1)	1/2	NONE	50A 240V CIRCUIT BREAKER RIGHT TOP TERMINAL 'L1'		
AS	91780-000	8	BLACK	30	N	1/2	NONE	TOP NEUTRAL TERMINAL BLOCK	1/2	21114-000	SELECTOR SWITCH TERMINAL #22		
M	91780-000	8	BLACK	36	T4	1/2	21114-000	VSS MAIN TERM #9	1/2	91320-003	GENERATOR TERM U2/T4 ON BLOCK POSITION OPPOSITE 'U'	FINAL ASSY CONNECTION	
N	91780-000	8	BLACK	10	T2	1/2	21114-000	VSS MAIN TERM #17	1/2	21114-000	VSS TERMINAL #8		
O	91780-000	8	BLACK	36	T12	1/2	21114-000	VSS MAIN TERM #21	1/2	91320-003	GENERATOR TERM W6/T12 ON BLOCK POSITION 'W'	FINAL ASSY CONNECTION	
P	91780-000	8	BLACK	36	T10	1/2	21114-000	VSS MAIN TERM #29	1/2	91320-003	GENERATOR TERM U6/T10 ON BLOCK POSITION 'V'	FINAL ASSY CONNECTION	
Q	91780-000	8	BLACK	10	T2	1/2	21114-000	VSS MAIN TERM #37	1/2	21114-000	VSS TERMINAL #28		
R	91780-000	8	BLACK	36	T2	1/2	21114-000	VSS MAIN TERM #41	1/2	91320-003	GENERATOR TERM V1/T2 ON BLOCK POSITION 'U'	FINAL ASSY CONNECTION	
S	10468-000	16	BLACK	10	T2	3/8	4158-000	VSS MAIN TERM #41	1/4	22370-006	VSS AUX SWITCH TERMINAL #12		
T	91780-000	8	BLACK	12	T2	1/2	21114-000	VSS MAIN TERM #45	1/2	21114-000	VSS MAIN TERMINAL #20		
V	91780-000	8	BLACK	36	T1	1/2	21114-000	VSS MAIN TERM #2	1/2	91320-003	SPLICE TO GENERATOR TERMINAL U1/T1		
W	10468-000	16	BLACK	14	T1	3/8	4158-000	VSS MAIN TERM #2	1/4	22370-006	VSS AUX SWITCH TERMINAL #10		
X	91780-000	8	BLACK	36	T7	1/2	21114-000	VSS MAIN TERM #10	1/2	91320-003	SPLICE TO GENERATOR TERMINAL U5/T7		
Y	10468-000	16	BLACK	16	T7	3/8	4158-000	VSS MAIN TERM #10	1/4	22370-006	VSS AUX SWITCH TERMINAL #14		
Z	91780-000	8	BLACK	8		1/2	21114-000	VSS MAIN TERM #18	1/2	21114-000	VSS TERMINAL #24		
AA	91780-000	8	BLACK	8		1/2	21114-000	VSS MAIN TERM #22	1/2	21114-000	VSS TERMINAL #16		
BB	91780-000	8	BLACK	30	N	1/2	21114-000	VSS MAIN TERM #26	1/2	NONE	NEUTRAL BLOCK		
DD	91780-000	8	BLACK	36	G2A	1/2	21114-000	VSS MAIN TERM #42 (RUN THROUGH CT #2)	1/2	NONE	50A 240V CIRCUIT BREAKER CENTER TOP TERMINAL 'L2'		
EE	91780-000	8	BLACK	32	G2B	1/2	21114-000	VSS MAIN TERM #46 (RUN THROUGH CT #2)	1/2	NONE	30A 480V CIRCUIT BREAKER CENTER TOP TERMINAL 'L2'		
FF	91780-000	8	BLACK	36	T8	1/2	21114-000	VSS MAIN TERM #28	1/2	91320-003	GENERATOR TERMINAL BLOCK POSITION V5/T8	FINAL ASSY CONNECTION	
GG	10468-000	16	BLACK	10	T8	3/8	4158-000	VSS MAIN TERM #37	1/4	22370-006	VSS AUX SWITCH TERMINAL #8		
HH	10468-000	16	BLACK	36	GRD	1/4	22370-006	VSS AUX SWITCH TERM #23	3/8	7547-000	GROUND TERMINAL	FINAL ASSY CONNECTION	
II	91780-000	8	BLACK	32	G3A	1/2	21114-000	VSS MAIN TERM #40 (RUN THROUGH CT #3)	1/2	NONE	50A 240V CIRCUIT BREAKER LEFT TOP TERMINAL 'L3'		
JJ	91780-000	8	BLACK	32	G3B	1/2	21114-000	VSS MAIN TERM #48 (RUN THROUGH CT #3)	1/2	NONE	30A HIGH VOLTAGE CIRCUIT BREAKER LEFT TOP TERMINAL 'L3'		
LL	10468-000	16	BLACK	48	7	1/4	22370-006	VSS AUX SWITCH TERM #5	3/8	61898-000	SUPPRESSION REGULATOR TERMINAL #7	FINAL ASSY CONNECTION	
MM	10468-000	16	BLACK	48	8	1/4	22370-006	VSS AUX SWITCH TERM #9	3/8	61898-000	SUPPRESSION REGULATOR TERMINAL #8	FINAL ASSY CONNECTION	
BO	10468-000	16	BLACK	8	1	1/4	22370-006	AUX SWITCH POSITION 17	1/4	22370-006	AUXILIARY SWITCH POSITION #19		
BP	10468-000	16	BLACK	8	1	1/4	22370-006	AUX SWITCH POSITION 19	1/4	22370-006	AUXILIARY SWITCH POSITION #21		
BQ	10468-000	16	BLACK	8	1	1/4	22370-006	AUX SWITCH POSITION 21	1/4	22370-006	AUXILIARY SWITCH POSITION #23		

DSE 7310 MKII WIRING DIAGRAM

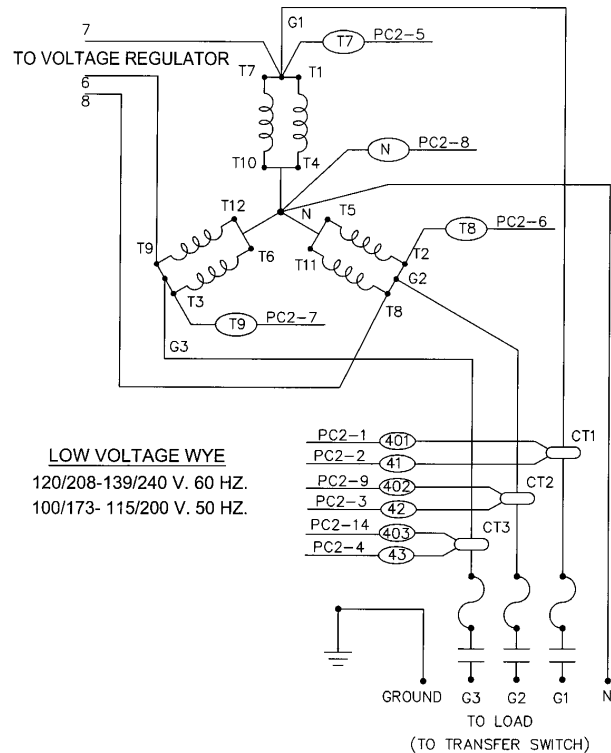


THREE PHASE AC WIRE HIGH AND LOW WYE

THREE PHASE - HIGH WYE 277/480V

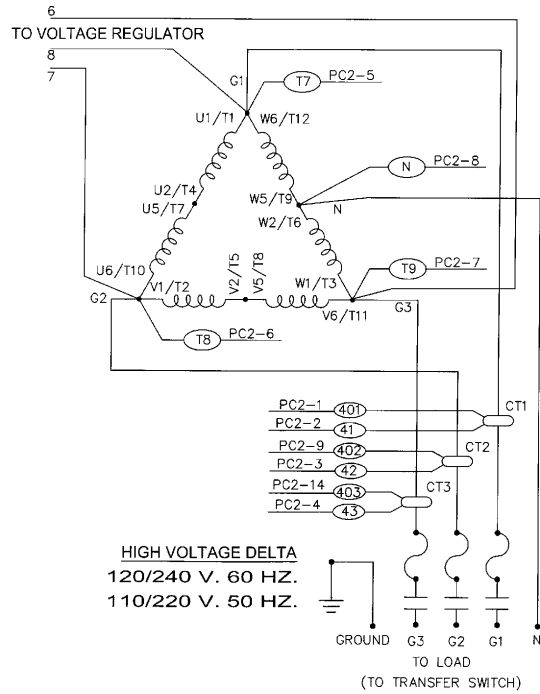


THREE PHASE - LOW WYE 120/208V



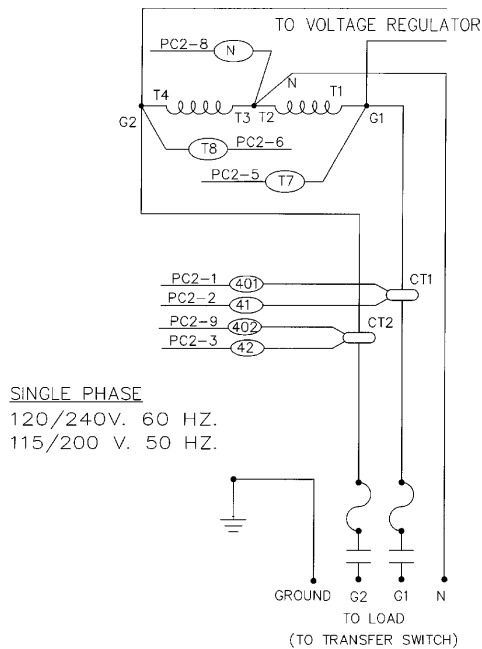
THREE PHASE WIRING - DELTA

THREE PHASE DELTA 120/240V

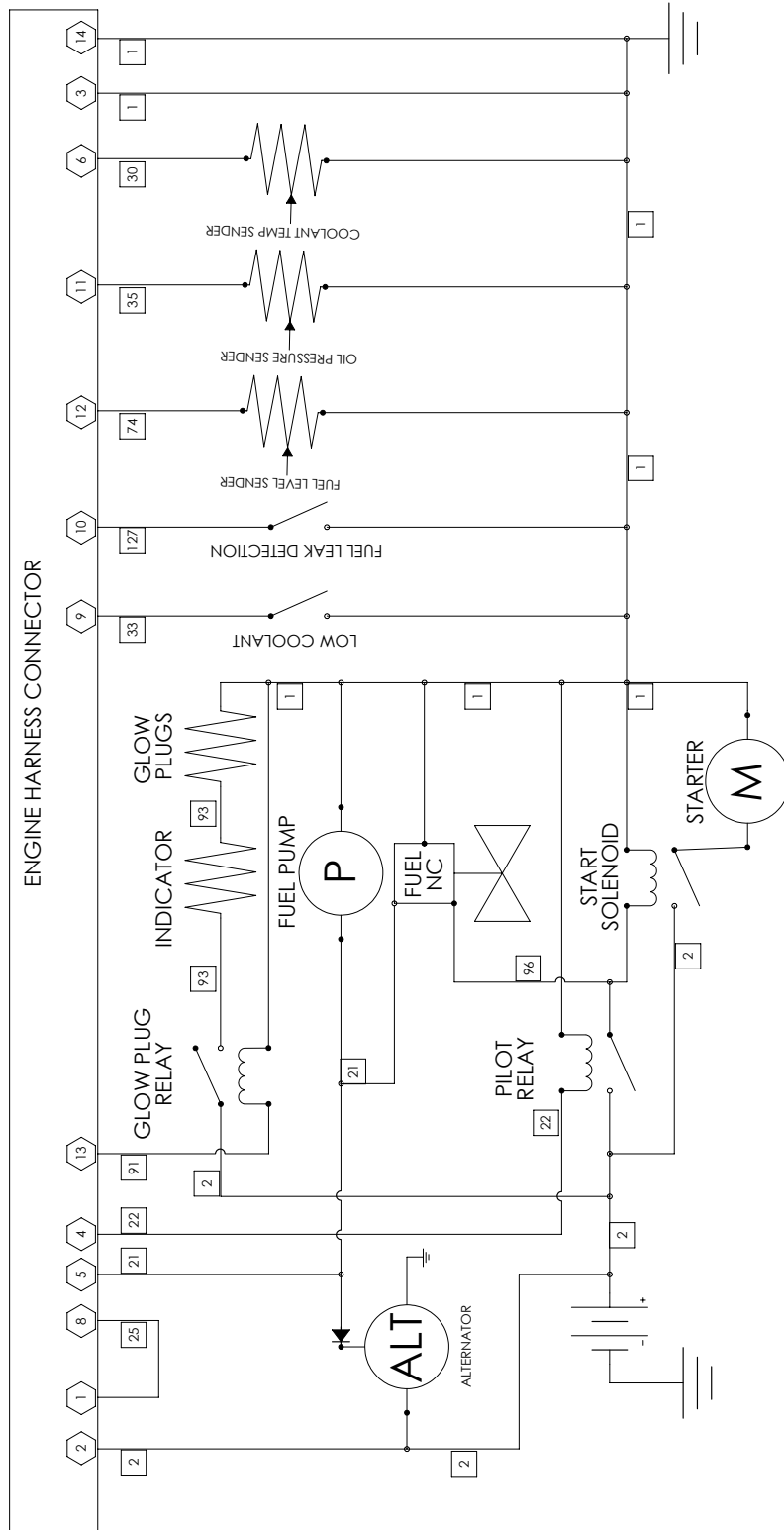


SINGLE PHASE AC WIRING - 4 LEAD

SINGLE PHASE 120/240V



ENGINE WIRING HARNESS





12 MONTH LIMITED WARRANTY

WINCO, Incorporated warrants to the original purchaser for 12 months or 1000 hours which ever occurs first, 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 or 1000 hours which ever occurs first 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 or 1000 hours which ever occurs first, 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. Engines are covered exclusively by the warranties of their respective manufacturers, see enclosed warranties.

WINCO does not warrant 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.

This warranty does not include travel time, mileage, or labor for removal or re-installation of WINCO product from its application.