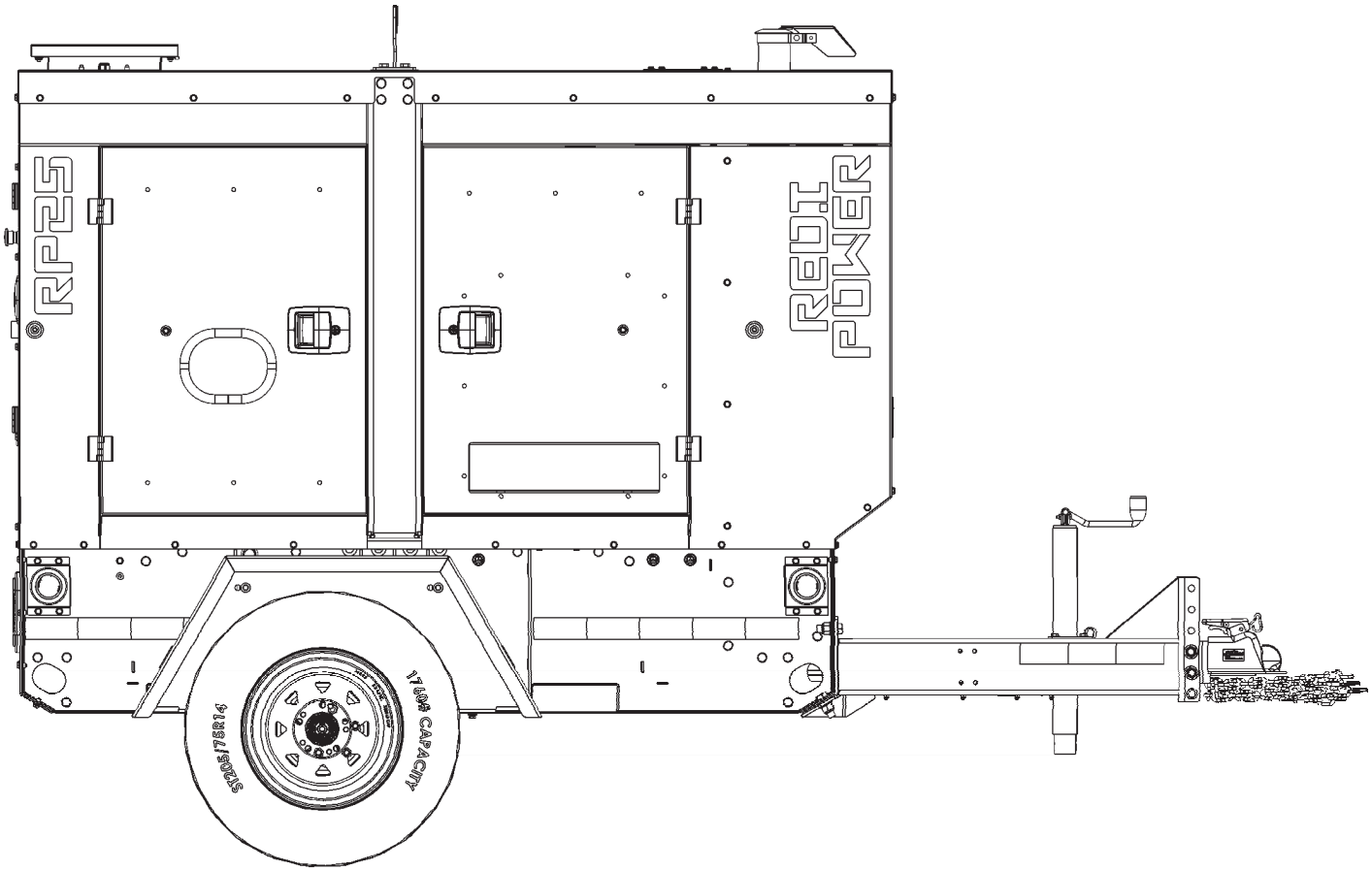
WINCO GENERATORS
AN AMERICAN COMPANY

RP25I4

INSTALLATION & OPERATORS MANUAL



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 concerning this unit, it will help us to respond to your needs faster.

MODEL _____

SERIAL NUMBER _____

PURCHASE DATE _____

DEALER NAME _____

DEALER PHONE # _____

MAINTENANCE KIT
16200-023

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SAFETY INFORMATION

CALIFORNIA PROPOSITION 65

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.

WARNING: 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 for your application.

WARNING: 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.

NOTICE

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.

NOTICE

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.

WARNING: 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.

WARNING

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 room (i.e. through windows, walls, floors).

WARNING: PERSONAL INJURY

The muffler becomes very hot during operation and for a period after the unit has been turned off. Do not touch the muffler until it has completely cooled off.

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.

SPECIFICATIONS

			STANDBY			PRIME		
	VOLTS	POWER FACTOR	WATTS	KVA	AMPS	WATTS	KVA	AMPS
SWITCHABLE	120/240 1-PH	1.0	22,000	22,000	91	20,000	20,000	83
	120/208 3-PH	0.8	23,000	28,750	80	21,000	26,250	73
	277/480 3-PH	0.8	23,000	28,750	34	21,000	26,250	31
DEDICATED	120/240 3-PH	0.8	23,000	28,750	69	21,000	26,250	73
	346/600 3-PH	0.8	23,000	28,750	27	21,000	26,250	25

ENGINE

Make	Isuzu
Model	4LET2TAGV09
Displacement	2.2L
Governor	Electronic
Fuel	ASTM D-975-1D or 2D EN590 or equivalent
Oil Type	See Lubrication section
Oil Capacity	2.75 Gal
Cooling System	50/50 Mix

For more engine specifications see WINCO's spec sheet SP-327.

GENERATOR END

Make	Stamford
Model	S0L2-P
Winding Group	
208/240/480V	311
600V	17
Resistances at 22°C	
Rotor	0.806 Ω
Stator	0.348 Ω per phase series star connected
Exciter Rotor	0.109 Ω per phase series star connected
Exciter Stator	16.126 Ω
Voltage Regulator	DSE A109

INTRODUCTION

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 with the DSE 7310 MKII.

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 frequency regulation is maintained by the engine governor to within +/- .5 Hz or better with the 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. The generator set is skid mounted with isolation mounts between the engine and base on all units.
The RP25 is a 12 volt system and requires one 12V battery 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 RP25 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 10 seconds on/10 seconds off, and 30 second 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 world-wide 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 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.

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 WINCO Service at 507-357-6831.

PREPARING THE UNIT

START-UP CHECK LIST

A Start-Up Completion & Warranty Validation Form was sent along with this manual. This must be completed and returned to WINCO Inc. within 180 days of the factory invoice date. If this form is not returned, the Warranty may be voided.

UNPACKING

1. As you receive your unit, it is critical to check it for any damage and annotate it on the BOL. If damage is noted, contact WINCO for assistance in getting the generator repaired.

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 four points on the generator base frame. The fuel tank and trailer lifting eyes should not be used for complete assemblies.

CAUTION

Lifting a unit with diesel in the fuel tank will cause sloshing and unbalance the unit.

TOWING THE EQUIPMENT

NOTICE

Only transport by a towing vehicle with adequate GVWR rating.

CAUTION: EQUIPMENT DAMAGE

Never operate generator set during transportation.

1. Always use a vehicle capable for safe operation.
2. Never tow without the safety chains secured. Always inspect safety chains, replace if damaged.
3. Always use the proper hitch size and type on the vehicle.
4. Never attempt to tow with a vehicle without side mirrors installed.
5. Verify all trailer lights function as intended.
6. Verify all lug nuts on the trailer are secured. Repeat this process after traveling 50 miles.

BREAK-AWAY SYSTEM

A break-away system has been installed. Should the trailer become disconnected while driving, the break-away system will engage the electric breaks.

Always test the system before each outing by pushing the TEST button.

There are three readings:
Full
Low
Charge

SETTING THE JACKS

WARNING

Ensure the generator is properly secured on level ground. Failure to do so could cause the generator to suddenly roll away or move.

1. Rotate the front jack from transport position to run position.
2. Level the unit using the jack before starting the unit.
3. Return jack to transport position before moving the unit.

INSTALLATION

The max ambient temperature is 120°F. For derating information, see specification sheet. This unit should be installed in a well ventilated area, ensuring the exhaust air cannot be recirculated back into the engine.

CAUTION

This unit will get hot while it is running and for some time afterward.

CAUTION

Before proceeding with the installation, be sure the engine control is in the "stop" position and the emergency stop depressed. Also, 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 can be supplied as weather enclosed, trailered packages. The DOT certified trailer is available for mobile applications. Consult a qualified, licensed electrician or contractor to install and wire the genset.

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 is 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.

NOTICE

For full service switching of the entire load, the ATS must be 'SE' (Service Entrance) rated or must have a properly rated fusible disconnect installed before the ATS to protect the contacts.

ENGINE GENERATOR SET MOUNTING

The unit's main frame must be securely bolted to a solid base. The engine-generator is mounted on channels which are attached with special shock mounts to the main frame.

This allows the engine-generator free movement without affecting the base or surrounding equipment.

CAUTION: EQUIPMENT DAMAGE

Never mount these engine-generator sets to a wooden base/structure. Over time, the wood will deteriorate and the unit mountings will come loose. These units must be mounted to a steel or concrete base.

The unit should be mounted to allow ample working room around it. A general rule to follow is to allow 24 inches or more of clearance for maintenance. Follow local codes for clearance from combustible surfaces.

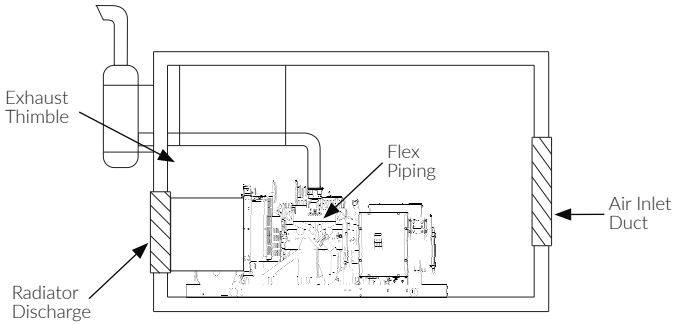
OPEN SKID VENTILATION REQUIREMENTS

CAUTION: EQUIPMENT DAMAGE

It is the installer's responsibility to ensure that there is sufficient cooling air available to prevent the engine and generator from over heating. Damage caused by overheating is not covered by warranty.

Providing proper air movement during your installation planning is essential. You will need to provide a fresh air inlet as well as a hot air outlet (to the outside of protection housing) for proper engine performance. These engine-generator sets are equipped with unit mount radiators and the engine is equipped with a pusher type fan. The hot air from the face of the radiator must be ducted out of the enclosure to ensure proper cooling. Failing to do so will allow the hot air to recirculate around the radiator causing the engine to overheat, resulting in an engine shutdown and damage. If louvers are used in front of the hot air duct to protect the unit from outside weather, the louvers should be 1½ times as large as the area of the radiator face to prevent back pressure.

Foam or other seals can be used to form a tight lip forcing all of the air from the engine fan out of the enclosure. In addition to a hot air discharge, you must plan a fresh air intake opposite the radiator discharge. Their fresh air inlets should be 1½ to 2 times larger than the radiator face. The extra air inlet area is required to minimize restriction and to provide combustion air for the engine. Do not block fresh air intakes with other equipment as this will result in insufficient air flow to the engine for cooling. Installing them opposite the hot air discharge will allow a sweeping flow of cooling air across the engine, preventing hot spots.



The WINCO installation manual OPM-112 contains additional information on indoor, open skid installations and is available electronically through our website or by requesting a copy from the factory.

EXHAUST INSTALLATION

CAUTION: PERSONAL INJURY

Improper exhaust installation will allow dangerous gases to seep into enclosed spaces. All exhaust must be piped out of the enclosure.

When selecting a location to exhaust fumes make sure that

the potential for contact with people is controlled. Exhaust can enter buildings through windows, ventilation systems and other openings if proper precautions are not followed.

The exhaust must be isolated from the vibration of the engine. If the exhaust is connected in a rigid system it will result in damage to the engine. The generator comes equipped with an engine mounted flex pipe to aid your installation. Ensure proper alignment with the generator. The flex can be eliminated if it is pushed to one side to make a connection.

The most direct path possible should be used to route the exhaust outside of the enclosure. Each bend restricts the pipe and increases back pressure. It may be necessary to increase the exhaust pipe diameter in some applications.

The exhaust pipe is very hot. When passing through the structure it is critical that a thimble or other appropriate technique is used to dissipate the heat and prevent the structure from catching on fire.

It is preferable to exhaust out the side of the enclosures. Slope the pipe slightly downward away from the engine to cause any water in the exhaust to run away from the engine. Do not exhaust near intake. Once outside the enclosure a rain cap or other technique must be used to keep water out of the exhaust. In mobile applications makesure the rain flap faces to the rear of the vehicle so that it is not blown open during transportation.

The generator ships with a critical grade muffler that should be installed to decrease noise. It can be mounted either internally or externally to the enclosure. The muffler cannot increase back pressure to more than 0.725 psi.

FUEL INSTALLATION

The fuel supply should be as close as possible to the engine. This will reduce the installation cost of fuel runs. The information in this manual is offered to assist you inproviding the proper fuel for your engine. However, this information is only provided to inform you of the engine's requirements and assist in making you aware of the decisions you must make. In no case should the instructions and information provided be interpreted to conflict with any local, state or national codes. If in doubt, always consult your local fire marshal, gas supplier or building inspector.

CAUTION

All fuel runs should be installed by a licensed fuel supplier. In no case should the instructions or information provided be interpreted to conflict with any local, state, or national codes. If in doubt, always consult your local fire marshal or fuel supplier.

INSTALLING THE FUEL LINE

CAUTION

Connecting rigid fuel line (i.e. steel or copper line)directly to the inlet fuel filter or fuel pump may causethe fuel line to crack during operation creating a serious fire hazard.

The fuel supply should be as close to the engine as possible. This will reduce the installation cost of fuel runs and minimize line losses. The diesel fuel supply should be no more than 3 feet below the fuel inlet on the pump. If your fuel supply is lower than three feet you may have to install an additional lift pump to bring the fuel up to the mechanical fuel pump on the engine.

The information in this manual is offered to assist you in providing the proper fuel for your engine. However, this information is only provided to inform you of the engine's requirements and assist in making you aware of the decisions you must make. In no case should the instructions or information provided be interpreted to conflict with any local, state, or national codes. If in doubt, always consult your local fire marshal or fuel supplier.

Engine generator sets are properly adjusted before they leave the factory. Connecting a fuel supply with adequate supply volume is critical to reliable operation. Diesel units with optional base mounted fuel tanks are pre-plumbed to the mechanical fuel pump on the engine.

Open skid mounted diesel units are often supplied with capped inlet and return lines. The use of a sustainable customer supplied flexible fuel line is essential between the engine and fuel supply to provide a vibration break between your fuel supply and the engine.

INSTALLING THE BATTERY

CAUTION

In the following battery installation procedure, check to be sure the DSE 7310 MKII is in the "stop" positio

This should be your last step before initial start-up. The RP25 is a 12 volt system and requires one group 24 12V battery. The battery 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 preformed 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.

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.

WARNING

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.

NOTICE

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.

NOTICE

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.

WARNING: 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).

NOTICE

This unit is 12 Volt and is negative ground. Permanent damage will occur if they are connected to a 24 Volt system or a positive ground system. If you are using the truck batteries to start these units, you may have to disable the charging system to keep it from interfering with the vehicle charging system.

A 2 amp, electronic battery charger is provided standard on this unit. This battery charger has up to 40A hours capacity and is compatible with wet cell, gel cell, calcium, AGM, enhanced flooded battery or any other maintenance-free battery. The battery charger has safety features including short circuit, open circuit, overheating, overcharge, spark-proof, and reverse polarity.

SOLAR CHARGER

The WINCO solar charger consists of two parts; the solar panel and the Sun Guard charge controller. The solar panel collects the energy while the Sun Guard controls the charging process acting as a switch to prevent the solar panel from discharging or overcharging the battery. If you are experiencing problems with your solar charging system contact WINCO service for trouble shooting instructions.

For best results, it is necessary to clean the solar panel surface from dirt and snow build up.

BLOCK HEATER

The block heater on this unit is 1,500 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.

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 seven 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 an adjustable 0 to 5 minute 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 5 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.

AC CONNECTIONS

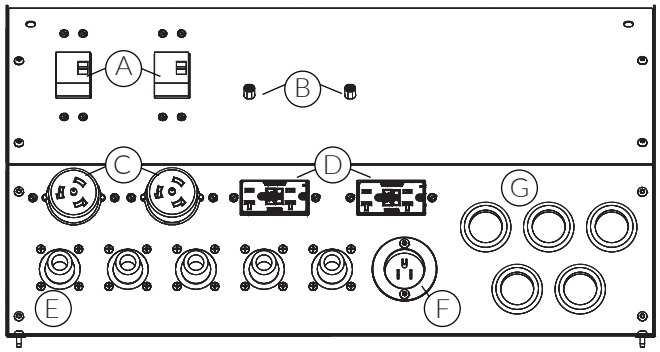
NOTICE: CLASS 1 WIRING METHODS ARE TO BE USED FOR ALL FIELD WIRING CONNECTIONS TO TERMINALS OF A CLASS 2 CIRCUIT

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
(If equipped)



WARNING: PERSONAL DANGER

Verify the main line circuit breaker and battery are disconnected before making connections. Failure could result in electrocution, which can result in serious injury or death.

A: 120/240 50A Circuit Breaker These circuit breakers protect the 2 - 50 amp twistlock receptacles (C).

B: 120/240 20A Circuit Breaker These two push button 20 amp circuit breakers protect the two GFCI receptacles (D).

C: 125/250 50A Receptacles 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 distribution box. Each receptacle is protected by a two pole 50 amp circuit breaker mounted just above it. THIS RECEPTACLE UTILIZES A HUBBELL PLUG PART # CS6365.

D: 120/240 20A Receptacles 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.

E: Cam-lock Connections These Cam-Locks are connected to the full load terminal blocks and are capable of providing full generator output in all voltage configurations.

F: 120V 20 AMP 3-Wire 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.

G: Grommeted wire 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.

WARNING

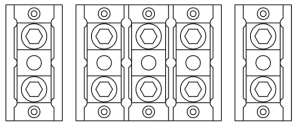
A mainline circuit breaker has been provided inside the generator housing. During all wiring installations, make sure the breaker is in the OFF position and the generator operating switch is in the OFF position.

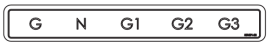
AC ELECTRICAL CONNECTIONS

WARNING

Wiring and connections to unit should be performed by a competent technician. Improper installation could result in electrocution, which could cause equipment damage, serious injury or death.

Access for routing the wires into the terminal block is provided via the access door located in the back of the unit. The top panel will hinge open once unscrewed.





NOTE: The neutral is bonded to ground. This connection can be found in the circuit breaker panel.

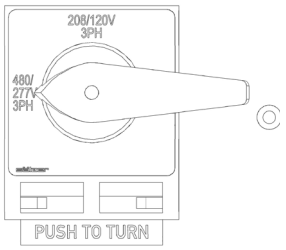
NEUTRAL LUGS:
These lugs are bonded to ground and provided for you to connect your neutral wire from the transfer switch to the generator. Lugs will handle up to 50 MCM wire. Torque lugs to 150 in. lbs. using #4 and #2 wire and 375 in. lbs. for 400-500 MCM wire.

GROUND LUG:
These ground lugs are bonded to neutral 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

VOLTAGE SELECTOR SWITCH

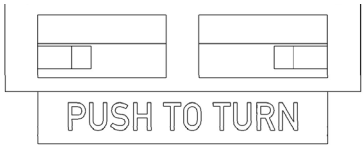
(If equipped)



WARNING: EQUIPMENT DAMAGE

Never change the selector switch position while the engine is running. The selector switch is equipped with a lockable e-stop. This needs to be depressed when switching voltages. It is recommended that the e-stop has a pad lock installed to ensure the voltage is not switched while the engine is running.

The selector switch is equipped with an e-stop. This e-stop needs to be pushed when switching voltages.



The three positions are 120/240V 1PH, 120/208V 3PH, 277/480 3PH. For 120/240V 3ph, place the selector switch to the 120/208 3PH position and adjust the rheostat to 240V. By doing this you will get 240V, but your line to neutral voltage will be approximately 139V.

GROUNDING

Proper grounding of your generator is application dependent. Carefully evaluate your planned use of your generator to understand which grounding you require. If you are not sure what to do, contact a competent professional to assist you. The NFPA 70 250:34-35 are good technical references.

PERMANENTLY INSTALLED GENERATORS

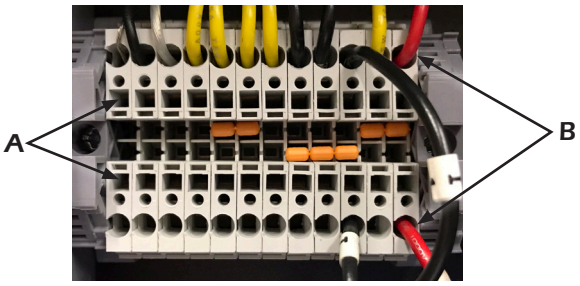
This WINCO portable generator ships with a bonded neutral and overcurrent protection. NFPA 70 refers to this as a “separately derived system.” When connecting it to a building a transfer switch specifically designed for GFCI and bonded neutral generators is required.

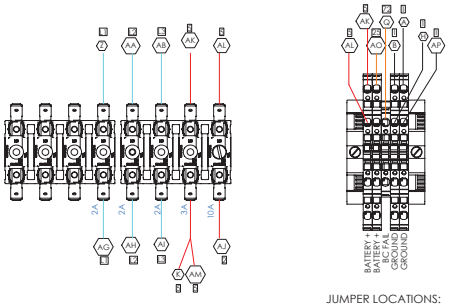
A competent technician can change the neutral configuration to match the application by following NEC wiring and ground labeling principles.

DC CONNECTIONS

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

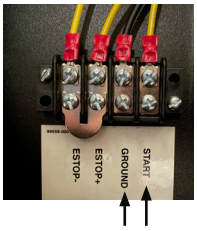
To install the wires, reference the following picture. Use a small flat head screwdriver to push the release spring inside the square hole (A). While the release is being pushed, insert the wire into the larger circular hole (B). Remove the screwdriver to secure the wire into place.





The E-Stop and Remote Start wires have been wired from the controller terminals to the panel for easy installation.

REMOTE START

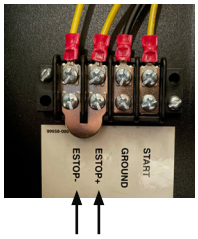


The two remote start leads from the Automatic Transfer Switch are connected to the two terminals marked GROUND & START. The WIRE in terminal GROUND is battery negative and the wire in the terminal labeled START is your remote start lead. Closing these two leads together will signal the DSE 7310 MKII to go into an autostart mode and start up the generator.

Depending on the distance, 14 to 16 gauge standard wire should be used. It is suggested that these wires be labeled S1 (ground) and S2 (start). The terminal blocks are designed to use terminal lugs on all wires and the screws should be torqued to 9.6 in. lbs.

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

E STOPS



In some applications additional emergency stops may be desired or necessary. The controller has terminals designed allowing the addition of multiple remote emergency stops. E-stops must be normally closed to work properly in this system. The e-stop circuit supplies power to the fuel solenoid and the starter circuit. Opening any switch in the series prevents the engine from cranking or from receiving fuel to run.

To wire additional emergency stop switches first remove the orange jumper between the two Emergency Stop terminal blocks. Failure to remove the jumper will prevent the remote switches from working properly. Add wires between the terminal block to the new switch(s). The switches must be wired in series for proper function. Test each e-stop after wiring to ensure they function properly.

SERIAL COMMUNICATION

DSE provides a series of remote accessories that can help provide useful information to operators. These accessories communicate over the DSE Net. Terminal blocks are wired to the distribution panel to aid in installation. Follow the instructions included with each accessory.

The generator controller can communicate with a variety of controls and monitoring systems, including RS232 and RS485. The ports are wired onto the back of the DSE7310. In order to finalize communication the program will need to be adjusted using the free DSE configuration software to enable the commutation. Contact Winco service for a list of register values.

DC INTERCONNECTIONS TO THE ATS

WARNING

Use a properly installed transfer switches when isolating the generator set from utility power. Failure to do so could result in backfeeding, which is illegal and dangerous. Backfeeding cause serious injury or death.

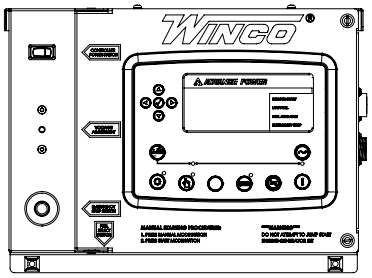
WARNING

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.

STARTING PROCEDURE



O	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.
I	START - Pressing this button from STOP/ RESET will start the engine and run the load.
AUTO	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.
FUEL SELECT SWITCH	A small rocker switch is located on the underside of the engine control cabinet. On gaseous models, the engine timing is controlled by the ECU on the engine and you need to tell it what fuel you want to operate on; LP or NG. On diesel models, this switch has been disconnected and will do nothing.

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.

SHUTDOWN

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

(if equipped)

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

When the 120/240V 1-ph or the 277/480V 3-PH positions are selected the AVR will automatically adjust the output to the nominal voltage. The voltage trim rheostat will be disabled. If you application requires a voltage different than nominal, installing the following jumpers will enable the rheostat in these positions.

120/240V 1-PH: Input D to ground
277/480V 3-PH: Input E to ground
The 120/208V 3-PH position always has the rheostat active and will need to be trimmed at start up to meet desired nominal voltage.

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	240
120/240V RECEPTACLES		110/220	120/240	120/240
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	240
120/240V RECEPTACLES		110/200	120/208	139/240
LINE TO NEUTRAL	ALL	115	120	127
120V RECEPTACLES	ALL	115	120	127
277/480V THREE PHASE				
LINE TO LINE	ALL	460	480	480
120/240V RECEPTACLES		NONE	NONE	NONE
LINE TO NEUTRAL	ALL	240	277	277
120V RECEPTACLES		NONE	NONE	NONE

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.

WARNING: EQUIPMENT DAMAGE

Changing the voltage switch with the engine running may result in damage to the equipment.

This generator is equipped with a shunt trip circuit breaker that is interrupted by the DSE7310 controller if current limits are exceeded. These limits are adjusted based upon the nominal voltage of the current switch position.

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 the main line circuit breaker.

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 ouptut 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 - In manual mode, pressing the STOP/RESET 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. Pressing the STOP/RESET button a second time will shut down immediately.

In the event of an emergency, the E-Stop can be pushed.

WARNING: EQUIPMENT DAMAGE

Stopping the generator without sufficient cool-down time, can result in premature wear and cause damage to engine components. The E-Stop and override shutdowns should only be used in the event of an emergency.

AUTO MODE

To activate the automatic start mode you will just need to depress the AUTO button, the LED indicator beside the button confirms that the unit is in automatic mode.

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 and start over.

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

1. Receptacle Panel -
   A variety of receptacles have been provided for your convenience . The 120V receptacles are powered when the voltage selector switch is in the 120/240 single phase, and 120/208V three phase position. The 240V receptacles are only usable in the 120/240V single phase 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 The neutral and ground are connected together at this panel. For use with an isolates neutral, remove the jumper strap between the neutral connection block and the ground lug. This will isolate the neutral from the ground and allow your 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 musts be removed at the terminal block.

CONTROL POWER

The DSE7310 controller consumes small amounts of battery power when it is in use. The controller comes with a power switch that disconnects battery power when it is not in use. The switch is designed with a safety relay that prevents it from removing power to the controller while the generator is operating. If the switch is turned off while the engine is running it will continue operating until the engine shuts down and then the controller will power down.

This switch should be used when the generator is not going to be used over the course of several days and the generator is not connected to a battery charger.

A solar charger kit is the easiest way to always maintain the battery during storage in mobile applications. The supplied battery charger can be plugged in to an extension cord on mobile applications.

AVR WIRING

DSE A109

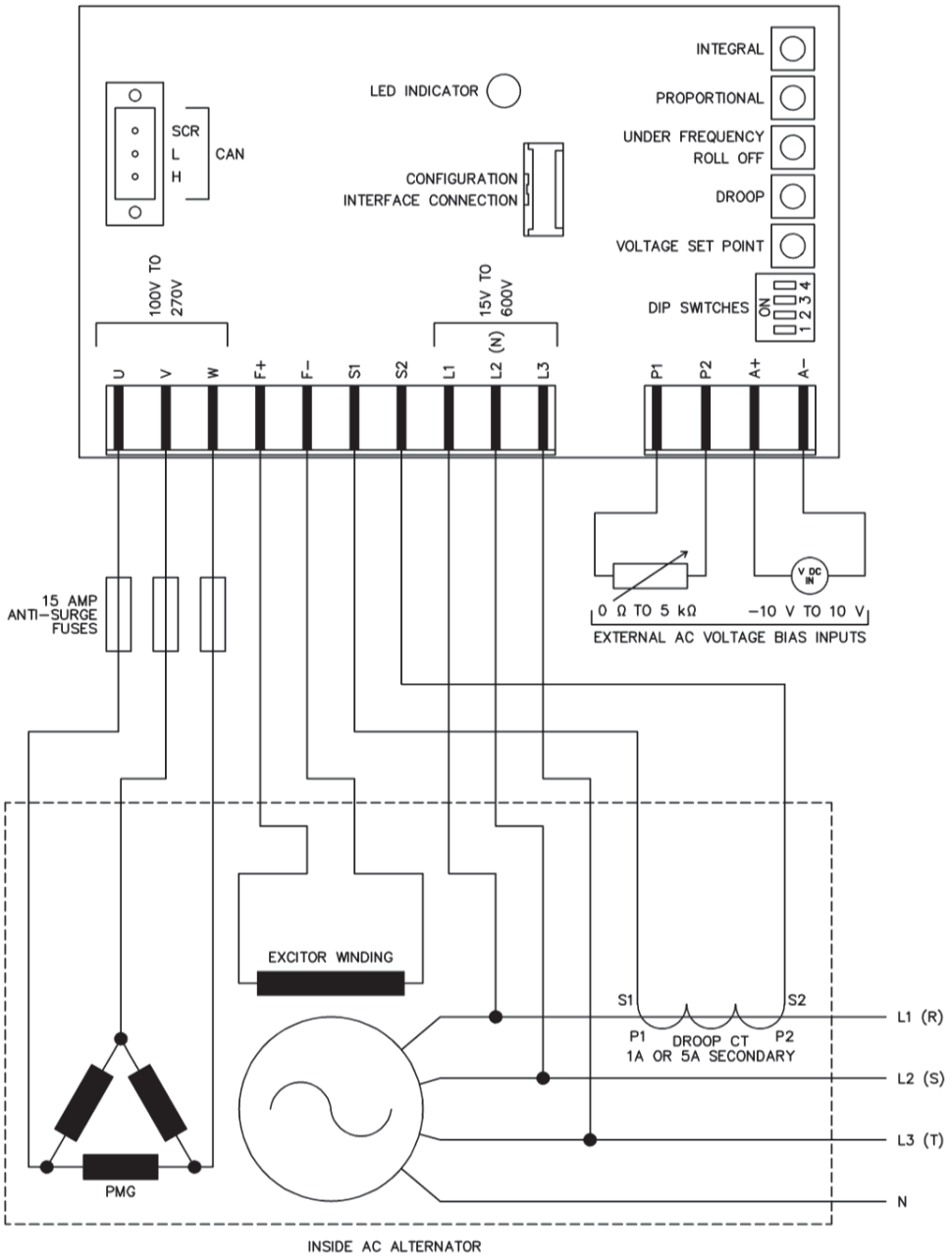
This generator set has a Deep Sea digital automatic voltage regulator (AVR) with CAN communication. The AVR maintains a smooth, stable regulated AC output voltage, regardless of the electrical load connected.

The wiring schematic below has been modified to suit our engineering design. The following adjustments have been made:

1. L1, L2, L3 have been modified so that L2 has been moved to L3 and L3 has been moved to L2.

2. The CAN has been connected to the controller.

3. P1 and P2 are used for voltage adjustment.



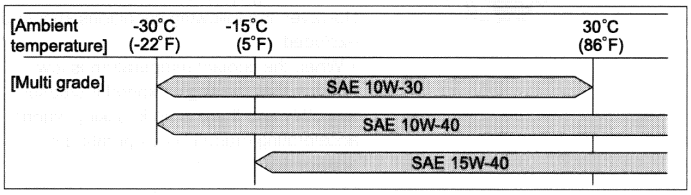
MAINTENANCE

CHANGING THE OIL

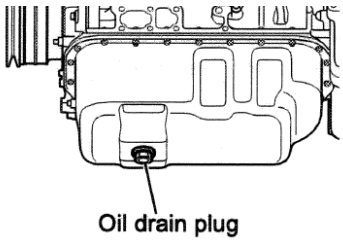
CAUTION: PERSONAL INJURY

Only change oil when the engine is not running and is at a low temperature in order to avoid the risk of burns.

WINCO recommends our 5W-40 fully synthetic heavy duty engine oil to give you maximum cold weather protection while maintaining excellent performance in warmer weather. We have partnered with a national lubrication oil manufacturer to give you access to Winco private branded premium oil available at comparable prices to conventional oils. See your dealer for additional information.



1. Place a drip pan or suitable container for catching the oil below the drain plug. WINCO has supplied a valve to hook a customer supplied 5/8" hose to conveniently run the oil to the drip pan.

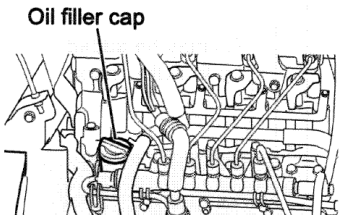


2. Remove the dip stick and remove the engine lubricant oil filter plug.

3. Drain the oil by removing the plug from the oil sump.

4. Once the sump has fully drained, close the valve.

5. Top-off through the filler cap using lubricant oil with the suitable oil table in the LUBRICATION section of this manual.



6. Use the dip stick to ensure the level of oil does not exceed the "MAX" limit.

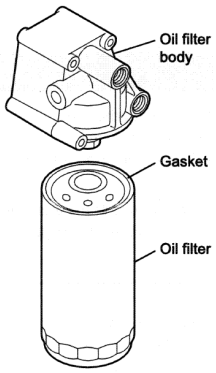
7. Insert the dipstick and close the lubricant filler cap.

8. Dispose of oil in accordance to local codes. DO NOT dispose or allow oil to seep into the ground or sewer systems, doing so will cause environmental damage.

CHANGING OIL FILTER

The filter must be replaced when the lubricant oil is changed.

Only use filters with a filtering degree equal to the original filter.



CAUTION: PERSONAL INJURY

Only change oil when the engine is not running and is at a low temperature in order to avoid the risk of burns.

1. Use an oil filter wrench to unscrew and remove the oil filter from the filter body and recover the gasket.

2. Replace the oil filter and gasket.

3. Carefully clean the surfaces of the support that are in contact of the gasket.

4. Moisten the gasket with a thin layer of oil and place it in its seat on the oil filter.

5. Manually tighten the new oil filter on the mount until it is fit up against the gasket.

6. Using the oil filter wrench, further tighten the oil filter.

CHANGING COOLANT

CAUTION: PERSONAL INJURY

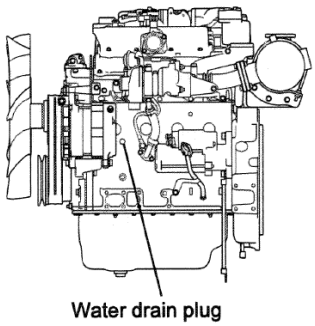
Only proceed when the engine is not running and is at a low temperature in order to avoid the risk of burns.

Usage Region	Outside Temperature
Warm region	10°F or above
Cold Region	-22°F - 10°F

1. Remove the cap on the radiator.

2. Open the coolant drain cock on the radiator to discharge the coolant.

3. Loosen the water drain plug located on the left side of the cylinder block. Discharge the coolant inside the engine.



4. Close the drain cock and the water drain plug. Refill radiator with coolant.

REFILLING COOLANT

1. Remove radiator cap. **Slowly** add coolant to the filler opening.

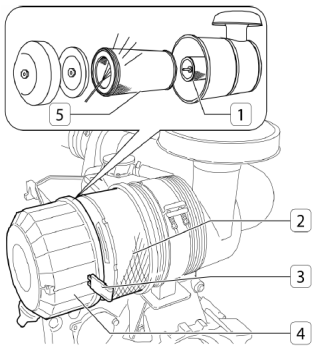
2. Loosen the air bleeder plug of the EGR cooler to remove any air from the coolant.

3. Tighten the air bleeder plug when the coolant overflows.

4. Firmly close the radiator cap.

5. Fill the reserve tank up to the specified level, close the reserve tank cap.

CHANGING AIR FILTER



Do NOT remove filter while engine is running.

1. Remove the air filter cover (4) after having released the two quick closing hooks (3).

2. Remove the filter (5). During this operation, take care to ensure that no dust enters the sleeve.

3. Position the filter (5) in its seat.

4. Replace the cover (4) of the air filter and lock it in place using the two quick release hooks (3).

CHECKING WATER IN FUEL FILTER

WARNING: EQUIPMENT DAMAGE

Clean the exhaust valve prior to checking the pre-filter to reduce the risk for system contamination.

Do NOT perform while the engine is running.

1. Loosen the drain plug and air bleeder plug to discharge the fuel inside the filter.

2. Place a container for collecting liquids under the pre-filter.

3. Unscrew the plug located at the bottom of the filter.

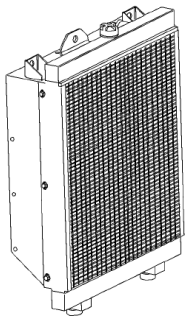
4. Drain the fluid until only fuel comes out.

5. Fully hand-tighten the plug.

6. Dispose of liquid in accordance to local codes. DO NOT dispose or allow liquid to seep into the ground or sewer systems, doing so will cause environmental damage.

CLEANING RADIATOR

The surfaces of the radiator come into contact with the outside air and can be subject to deposits and impurities. Clean in accordance to the maintenance schedule with compressed air or steam.



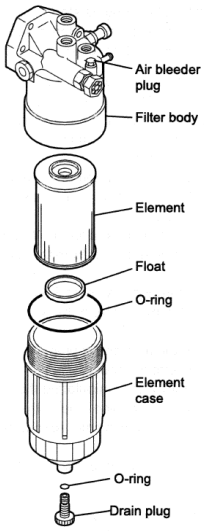
CHANGING THE FUEL FILTER

1. Loosen the drain plug and air bleeder plug to discharge the fuel inside the filter.

2. Using a filter wrench, remove the case.

3. Replace the O-ring of the case and drain plug with the new ones, place the new element in the case. Thinly apply fuel on the O-Ring and screw in the element.

4. Remove air from the fuel.



STORAGE

PREPARING THE ENGINE FOR A LONG PERIOD OF INACTIVITY

In the case of a planned period of inactivity that lasts longer than two months, to prevent the interior parts of the engine and some components of the injection system from oxidizing, prepare the engine as follows:

1. Drain the lubricant oil from the sump after heating the engine.
2. Pour 30/M protective oil into the engine up to the “minimum” level indicated on the oil level dipstick. Start the engine and run it for approx. 5 min.
3. Drain the fuel from the injection circuit, from the filter and from the injection pump channels.
4. Connect the fuel circuit to a tank containing CFB protective liquid (ISO 4113) and introduce the liquid by

pressurizing the circuit and driving the engine for approx. 2 min. after excluding injection system operation.

The operation required can be completed by directly polarizing terminal 50 of the electric starter motor with positive voltage equal to that of the nominal system voltage, using the designated conductor.

5. Nebulize the 30/M protective oil in a quantity of approx. 130 g (10 g per liter of displacement) in the turbocharger intake inlet, during the engine turning operation described in the previous paragraph.

6. Close all of the engine's intake, discharge, ventilation and bleeding holes with plugs or seal them with adhesive tape.

7. Drain the residual 30/M protective oil from the sump, which can be used for an additional 2 preparations.

8. Place warning notices of ENGINE WITHOUT OIL on the engine and dashboard.

NOTE: When storing in cold regions, make sure the coolant and engine oil are in conditions suitable to the environment. Also, when starting the engine after it has been stored, make sure that there is no snow or foreign matter that could interfere with engine startup, and rotating parts are not frozen.

MAINTENANCE SCHEDULE

Checks In Period of Use	**Frequency**
Check for water in the fuel filter	Daily
Check Air-Restriction Indicator on Filter	Daily
Engine Oil Level	Daily/Prior to Use
Engine Coolant Level	Daily/Prior to Use
Planned Maintenance	**Frequency**
Tension and Condition Check of Ancillary Belt	500 Hours
Engine Oil Replacement	250 Hours
Oil Filter Replacement	500 Hours
Fuel Filter Replacement	500 Hours
Clean Radiator	500 Hours
Air Filter Replacement	1250 Hours
Extraordinary Maintenance	**Frequency**
Ancillary Belt Replacement	3000 Hours
Turbocharger Visual Inspection	1500 Hours
Alternator Visual Inspection	3000 Hours
Clean/Replace Radiator Cap	3000 Hours
Engine Coolant Replacement	3000 Hours

NOTE: Some operating conditions may require more frequent maintenance intervals.

TROUBLE SHOOTING TABLES

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 Defective DSE 7310 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 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

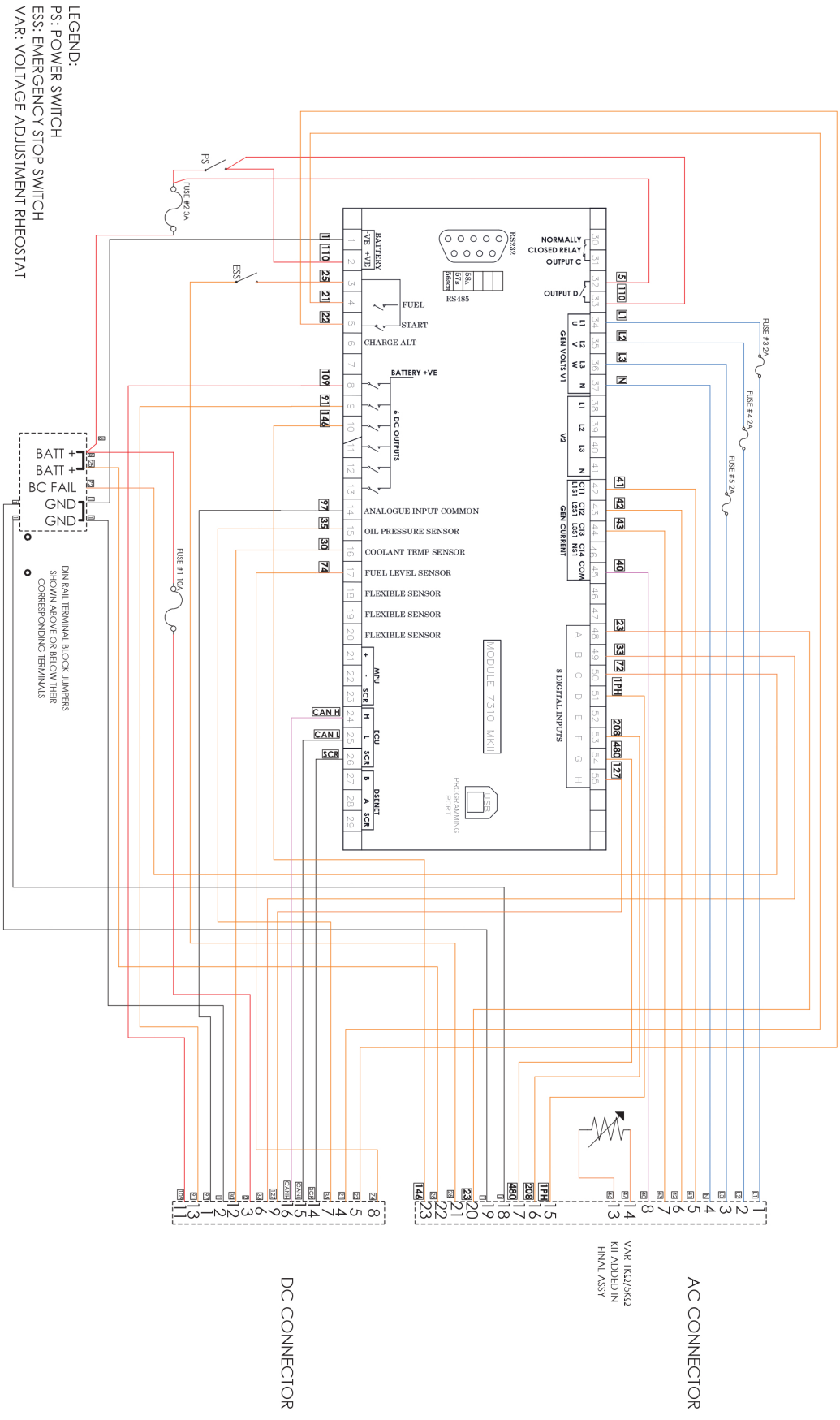
WIRING SIZE TABLE

The table below is based on Table 310.16 in the National Electric Code 2020 edition. Allowable ampacitier 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.

SIZE AWG OR KCMIL	75°C (167°F)	90°C (194°F)	75°C (167°F)	90°C (194°F)
	Wire Type: RHW, THHW, THW, THWN, XHHW, XHWN, USE, ZW	Wire Type: TBS, SA, SIS, FEP, FEPB, MI, PFA, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE-2, XHH, XHHW, XHHW-2, XHWN, XHWN-2, XHHN. Z, ZW-2	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
	COPPER		ALUMINUM OR COPPER-CLAD ALUMINUM	
8	50	55	40	45
6	65	75	50	55
4	85	95	65	75
3	100	115	75	85
2	115	130	90	100
1	130	145	100	115
1/0	150	170	120	135
2/0	175	195	135	150
3/0	200	225	155	175
4/0	230	260	180	205
250	255	290	205	230
300	285	320	230	260
350	310	350	250	280
400	335	380	270	305
500	380	430	310	350
600	420	475	340	385
700	460	520	375	425
750	475	535	385	435
800	490	555	395	445
900	520	585	425	480
1000	545	615	445	500
1250	590	665	485	545
1500	625	705	520	585
1750	650	735	545	615
2000	665	750	560	630

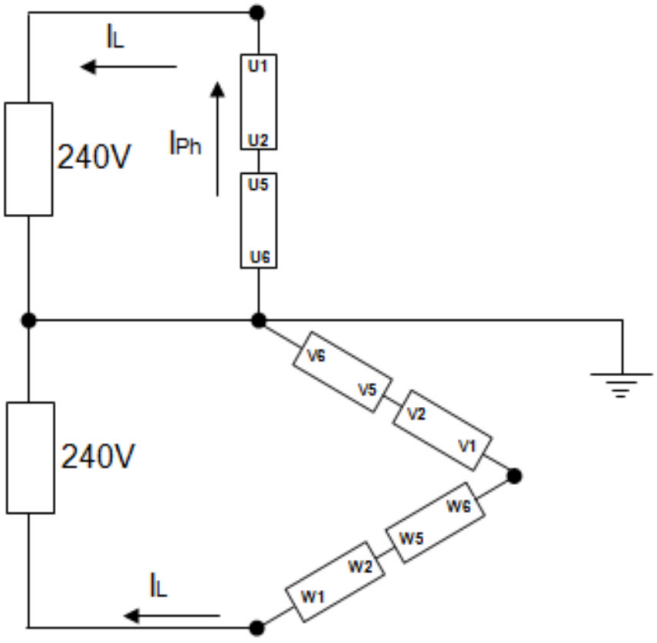
For additional information, see table 310.16 of the National Electric Code.

DSE7310 MKII WIRING DIAGRAM

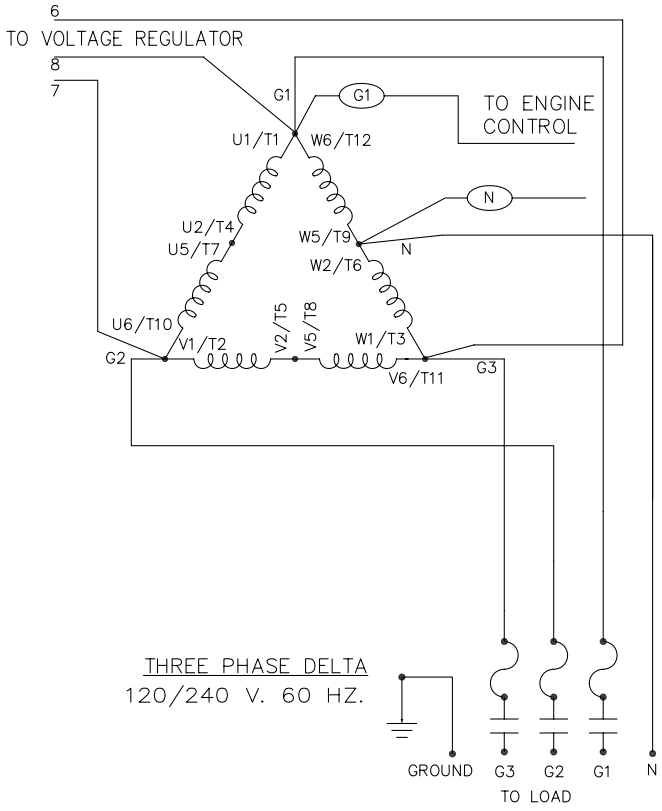


WIRING DIAGRAMS

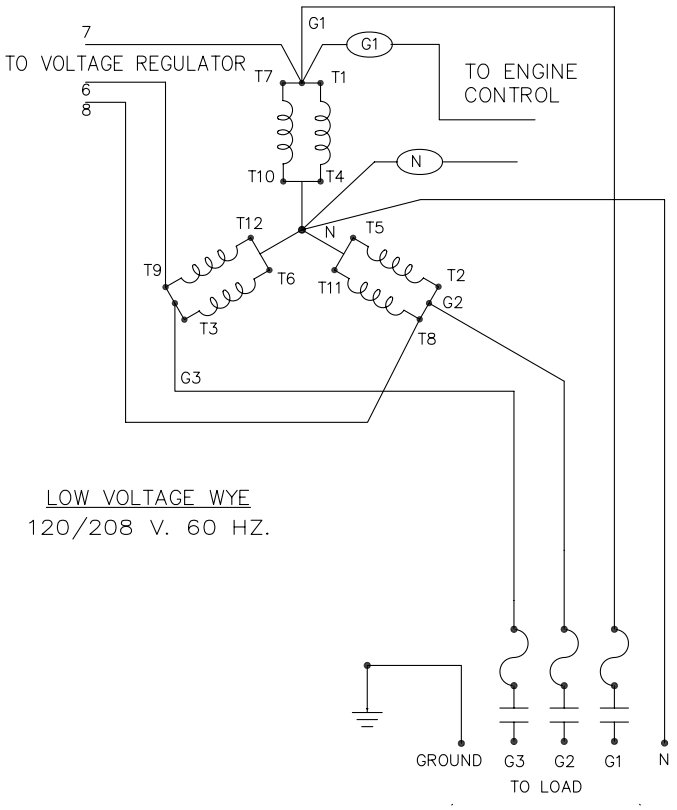
SINGLE PHASE ZIG ZAG



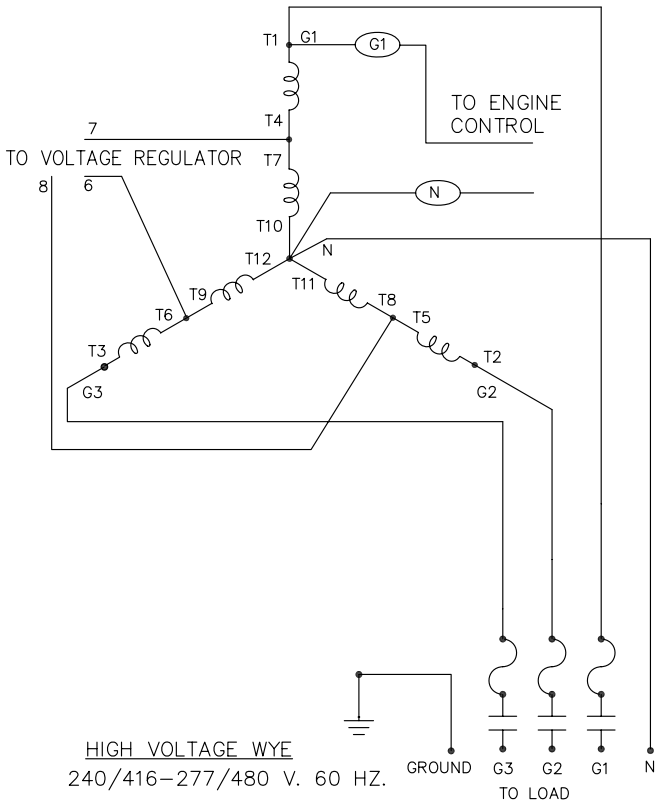
THREE PHASE WIRING - DELTA



THREE PHASE LOW WYE



THREE PHASE HIGH WYE



LIMITED WARRANTY

WINCO Incorporated warrants to the original purchaser for the warranty period 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, contact a Winco Authorized Service Center within the warranty period from date of purchase.

*NOTE: Units that are resold by original owner are not covered under this warranty. Any further warranty, whether expressed or implied, rests solely with the reseller.

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 the warranty period 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, INC. WARRANTY EFFECTIVE DATE

Air cooled units purchased for stock have 1 year to be sold. The warranty to the original retail customer commences on the date of sale of the product to them. All liquid cooled units have 180 days from the Winco invoice to submit a start up date. If no startup form is submitted, then warranty period starts on the Winco invoice date unit was sold.
Date of sale is defined as the day the customer takes delivery of the product. This warranty shall remain in effect to the original purchaser for the period stated on the sales literature. The warranty is not transferable and the retail customer must retain his original bill of sale as proof of purchase date.

WINCO, Inc. agrees to the following obligations during the warranty period:

1. To warrant any defect in material or workmanship of products sold under the WINCO and DYNA brand names in accordance with the warranty statements in the operator's manuals.
2. To reimburse authorized WINCO, Inc. Service Centers/Dealers for the cost of parts plus standard ground UPS shipping charges for all valid warranty repairs and to reimburse same said service centers/dealers for reasonable labor charges based on WINCO's current warranty labor reimbursement rate.
3. To furnish its authorized service centers/dealers with the necessary parts to make the repairs. WINCO Generator Warranty Periods & Restrictions

WINCO GENERATOR WARRANTY PERIODS & RESTRICTIONS

Industrial Portables
WL Models - 3 Years, See Notes 1 & 2
W Models - 3 Years, See Notes 1, 2, & 5
DP Models - 3 Years, See Notes 1 & 2
HPS Models - 2 Years, Home Use ONLY; Commercial use* is 90 Day Warranty, See Note 1

EMERGEN-C (EC) SERIES

2 Years, See Note 1

DE SERIES

1 Year/2000 hours, No Travel Time

MOBILE DIESEL SERIES

1 Year/2000 hours, No Travel Time

PTO SERIES

15kW & 10kW - 1 Year, Limited Farm Standby Only
25kW thru 165kW - 3 Years, Limited Farm Standby Only/Commercial use* 1 Year

TWO BEARING SERIES

1 Year, Bench Labor and Parts only

GASEOUS/PACKAGED STANDBY SERIES (PSS)

Air-Cooled Models (PSS8, PSS12, & PSS20) – 2 Years/2000 Hours Standby Only See Notes 3 & 4 Prime Power use 1 Year/2000 Hours See Notes 3 & 4
Liquid-Cooled Models (PSS21 - PSS150) - 2 Years/2000 Hours Standby Only See Notes 3 & 4 Prime Power use 1 Year/2000 Hours See Notes 3 & 4

DIESEL STANDBY SERIES (DR)

Liquid-Cooled Models (DR12 - DR600) - 2 Years/2000 Hours Standby Only See Notes 3 & 4
Prime Power use 1 Year/2000 Hours See Notes 3 & 4
Accessories (Installed on Generator or shipped loose)
1 Year from factory invoice or 2000 Hours (whichever occurs first)

AUTOMATIC TRANSFER SWITCHES (ATS)

See ATS Manufacturer's Warranty

NOTES

Note 1: First 2 years of warranty coverage includes Parts and Bench Labor Only, no travel time or labor allowance for removal or reinstallation of the product from its application.
Note 2: 3rd Year warranty coverage is parts only/no labor.
Note 3: Round trip mileage is limited to 200 miles per trip and a total of 2 trips per repair unless authorized in writing by the WINCO Service Dept.
Note 4: Mileage allow on permanently installed units only. Trailer mount units is bench labor only.
Note 5: W3000 is a 1 Year Warranty.

*Commercial use is defined as Construction, Rental, Prime Power, or use in a business of any type including agricultural and hobby. Prime Power use is defined as any application where the generator set is being used 'off-grid' where there is no utility power present. Standby use is defined as an application where utility power is present -and- the generator set is used as emergency backup during utility power outages.

WINCO reserves the right to change or improve it's products without incurring any obligations to make such changes or improvements on products purchased previously.

EXCLUSIONS:

WINCO does not warrant Engines. Engines are covered exclusively by the warranties of their respective manufacturers.
WINCO does not warrant 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.
This warranty does not include travel time, mileage, or labor for removal or reinstallation of WINCO product from its application, unless specifically authorized.

WHAT IS COVERED BY WARRANTY

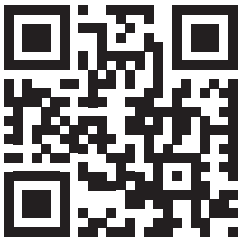
1. Generator end including rotor, stator, end brackets, and bearing.
2. Control box including transformers, circuit breakers, wiring, resistors, and switches.
3. LP/NG fuel system including fuel solenoid, demand regulator, carburetor, and hoses.
4. Cradle assembly including cradle, cross member, and shock mounts that fail. Shock mounts damaged from rough handling are not covered.
5. Reasonable travel time for the PSS & DR series generators only, that are permanently installed.
6. Ground shipping charges for warranty parts, no premium service, domestic US shipments only.

WHAT IS NOT COVERED BY WARRANTY

1. Products which have been subjected to alteration, modification, neglect or unauthorized repairs not approved in writing by Winco, Inc.
2. Products no longer owned by the original purchaser.
3. Products with shipping or freight damage. File a freight claim with the delivery carrier.
4. Products suffering normal wear, accidents, improper maintenance or improper protection in storage. Products damaged by rough handling, such as shock mounts on cradle assemblies.
5. Pressure or steam cleaning of products, cleaning of fuel system, or flushing of cooling system.
6. Replacement of filter, belts, antifreeze, or lubricants.
7. Electrical items, such as light bulbs, receptacles, spark plugs, or any items damaged by welding or jump starting.
8. Any repeat or shop come-back repairs resulting from poor service work or improper diagnosis and testing. Replacement of parts as a trial-and-error method of diagnosis will not be considered for warranty.
9. Replacement parts other than those sold by Winco, Inc.
10. Damage caused by fire, flood, lightning or any other natural disaster.
11. Damage caused by improper protection during installation, (i.e. not protecting contactor in the ATS panel and getting wire trimming or debris from drilling the box in the contactor coil or contacts.)
12. Damage caused by over loading of the generator and failure to adequately provide overload protection.
13. LP/NG fuel adjustments or conversion from one fuel to another.
14. Adjustment of any kind, all units are 100% load tested before shipping.
15. Any damage caused by the use of the equipment for purposes other than for which it was designed.
16. Engines - All engines used by Winco, Inc. are warranted by their respective manufacturer's.
17. Batteries - Must be returned to original battery manufacturer.
18. Damage caused by improper installation or failure to provide adequate ventilation.
19. Cosmetic repairs, such as repainting.
20. Freight charges for transportation to and from a Warranty Service Center.
21. Rental costs of renting replacement generators.
22. Travel time or service calls unless specifically authorized by Winco, Inc. in writing.

GENERAL INFORMATION

The WINCO, Inc. Service Department is open from 7:30 AM to 4:30 PM Central Standard time.
It is located at 225 South Cordova Ave., Le Center, MN, 56057-1805.
Phone Numbers: Service Department - 507-357-6831 FAX Line - 507-357-4857. Email address is service@wincogen.com
The phone number to for the General Switchboard/Sales Department is 507-357-6821.



WINCO®
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