

WINPOWER

*A Division of **DTT** Dyna Technology Inc*

DIESEL GENERATOR

DX SERIES SWITCHABLE VOLTAGE GENERATOR SET

MODELS: DX90 DX100 DX130
DX175 DX200 DX350



DX200

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the generator and batteries.

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

USING THIS MANUAL

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

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

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

COPY YOUR MODEL AND SERIAL NUMBER HERE

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

MODEL _____

SERIAL NUMBER _____

PART NUMBER _____

PURCHASE DATE _____

DEALER _____

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PROPER USE AND INSTALLATION

You must be sure your new engine generator set is:

- * Properly serviced before starting
- * Operated in a well ventilated area
- * Properly exhausted and gases safely dispersed
- * Wired by a qualified electrician
- * Operated only for its designed purposes
- * Used only by operators who understand its operation
- * Properly maintained

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the generator and batteries.

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

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

ANSI SAFETY DEFINITIONS

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.

NOTE:

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

1. **ELECTRIC SHOCK** - The output voltage present in this equipment can cause a fatal electric shock. This equipment must be operated by a responsible person.
 - a. Do not allow anyone to operate the generator without proper instruction.
 - b. Guard against electric shock.
 - c. Avoid contact with live terminals or receptacles.
 - d. Use extreme care if operating this unit in rain or snow.
 - e. Use only three-prong grounded receptacles and extension cords.
 - f. Be sure the unit is properly grounded to an external ground rod driven into the earth.

2. **FIRE HAZARD** - Deisel fuel presents a hazard of possible explosion and/or fire.
 - a. Do not smoke or use open flame near the generator set.
 - b. Keep a fire extinguisher nearby and know its proper use. Fire extinguishers rated ABC by NFPA are appropriate.
3. **DEADLY EXHAUST GAS** - Exhaust fumes from any diesel engine contain carbon monoxide, an invisible, odorless and deadly gas that must be mixed with fresh air.
 - a. Operate only in well ventilated areas.
 - b. Never operate indoors.
 - c. Never operate the unit in such a way as to allow exhaust gases to seep back into closed rooms (i.e. through windows, walls or floors).
4. **NOISE HAZARD** - Excessive noise is not only tiring, but continual exposure can lead to loss of hearing.
 - a. Use hearing protection equipment when working around this equipment for long periods of time.
 - b. Keep your neighbors in mind when permanently installing this equipment.
5. **CLEANLINESS** - Keep the generator and surrounding area clean.
 - a. Remove all grease, ice, snow or materials that create slippery conditions around the unit.
 - b. Remove any rags or other material that could create potential fire hazards.
 - c. Carefully wipe up any fuel or oil spills before starting the unit.
 - d. Never allow leaves or other flammable material to build up around the engine exhaust area.
6. **SERVICING EQUIPMENT** - All service, including the installation or replacement of service parts, should be performed only by a qualified technician.
 - a. Use only factory approved repair parts.
 - b. Do not work on this equipment when fatigued.
 - c. Never remove the protective guards, cover, or receptacle panels while the engine is running.
 - d. Use extreme caution when working on electrical components. High output voltages from this equipment can cause serious injury or death.
 - e. Always avoid hot mufflers, exhaust manifolds, and engine parts. They all can cause severe burns instantly.
 - f. Installing a generator set is not a "do-it-yourself" project. Consult a qualified, licensed electrician or contractor. The installation must comply with all national, state, and local codes.
 - g. Always make sure unit is disabled before placing your hands anywhere near the fan, belts, alternator or water hoses. This equipment is capable of stating automatically

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 generators 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 the applicable engines.

INTRODUCTION AND DESCRIPTION

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 hertz (cps), from no load to rated load for standard mechanical governors and to within +/- .5 hertz 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. The Generator Set is skid mounted with isolation mounts between the engine and base on all units.

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.

A customer supplied 12 (or 24) Volt battery is required to complete the installation. See appendix 1, to identify the voltage, size and CCA (Cold Cranking Amp) requirements for your specific unit.

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 / 15 seconds off, and a 2 minute cool down delay. The cool down delay can be changed in the field from 0 to 30 minutes by your dealer. Other features, timing cycles, set points and signal output capabilities are possible.

**** NOTICE ****

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

SPECIFICATIONS

In the appendixes in the back of this manual is detailed specifications on each of these units. The information below is just for general information on the major components that make up these generators. For detailed information on each model see the table starting on page 12.

GENERATOR SET:

Every WINPOWER 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 identity plates providing additional information to document build data for warranty and replacement parts.

Be sure to have the main WINPOWER unit data plate information recorded inside the front cover of this manual for future reference and for identification whenever requesting field or factory technical assistance. Primary fields needed for assistance are complete model number, serial number and especially the part number. The part number is recorded on the Nameplate. See the appendixes in the back of this manual for individual unit specifications and wiring diagram references.

ENGINE:

Each engine has a nameplate on it that gives the specific engine model number, build specification and the serial number for the engine. See the technical data pages in the back of this manual for individual engine specifications, fuel consumptions and wiring diagram references.

This manual covers specific operation of the combined engine generator set. Refer to engine operating and maintenance instructions for specific instruction on the care and maintenance of the engine. Oil and fuel requirements along with maintenance schedules and engine warranty information are provided by the individual engine manufacturers.

**** 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; check the Yellow Pages of the telephone directory under "engines," or ask the dealer from whom you purchased the power plant.

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 will decrease 3-1/2% for each 1000 ft. above sea level, and will decrease an additional 1% for each 10 degrees Fahrenheit above 60 degrees Fahrenheit. Units should not be operated in ambient temperature greater than 125 degrees Fahrenheit.

GENERATOR:

WINPOWER Generators Sets use totally brushless, AVR (Auto-Voltage Regulator) controlled broad-range generator ends. The generator converts rotational mechanical energy into electrical energy. Standard WINPOWER units are equipped with generators manufactured by Stamford/Newage. Each generator 'end' has its own data tag. The unique serial number is stamped on the data plate and into the upper section of the mounting adapter of the generator frame. The data label is affixed to the main frame of the generator on the lower left side.

TRAILER/HOUSING

These switchable voltage generators are normally shipped fully enclosed & mounted on a trailer. The size of the trailer may vary by both model and fuel tank size requirements. All the trailers are DOT approved and you should receive a Certificate of Origin with each unit. This will allow you to register the equipment and obtain tags from your state. If you should encounter any problems registering the trailers contact the Winpower Service Department at 507-357-6831.

RECEIVING THE GENERATOR

The generator set will generally be shipped by a commercial 'common freight carrier'. Large and bulky units are often shipped on a dedicated or specially contracted 'Flat-Bed' truck. The means of shipment is determined in consultation between the WINPOWER Sales and Shipping staff and the customer. Routing is determined by the bulk, size, and a means available to unload the generator at the receiving end. WINPOWER recommends units that are shipped by common carrier be delivered to a commercial dock to allow the Generator Set to be unloaded in a safe, efficient manner and to minimize handling damage to the unit.

Locate the packing slip on the side of the unit or request it from the truck driver. When receiving the unit take special care in examining the unit for damage during shipment. Avoid signing for the equipment until a full visual assessment and inventory have been made. Verify that you have received the right equipment and the proper amount by matching up the equipment to the packing list.

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

When loss or damage is noted after delivery, segregate the damaged material, and contact the carrier for claim procedures.

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

** CAUTION **

EQUIPMENT DAMAGE - *These units are 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.*

PREPARATION

**** WARNING ****

PERSONAL INJURY - Before proceeding with the unit preparation and wiring, be sure the DSE-7310 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

Consult a qualified, licensed electrician or contractor to install and wire this Generator Set. The installation must comply with all national, state, and local codes.

UNIT PREPARATION

These units have been fully tested before they left the factory. The only thing you should have to complete is adding fuel to the tank and installing the appropriate battery on the unit. See appendix 1 on page 13 for the correct battery size and CCA requirement.

FUEL REQUIREMENTS

During periods of normal operations these engines will all use #2 diesel fuel. Seasonally blended fuel should be used during time of extreme cold to insure proper engine operation. See the engine operators manual for more specific information on fuel requirements.

NOTE: - When starting the unit for the first 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

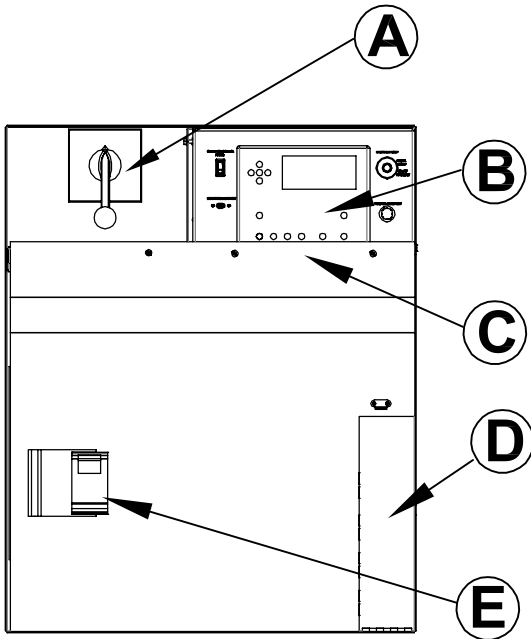
Before starting the engine, check the oil level in the crankcase. If it is low, refill to the full mark with the proper weight/grade of oil as recommended by the engine manufacturer's maintenance instructions. The necessity of using the correct oil, and keeping the crankcase full cannot be over emphasized. 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.

CONTROL PANEL & CONNECTION BOX

This control panel is located behind the rear side door on the right hand side of the unit. All operations control and most AC connection are located behind this door.



A. VOLTAGE SELECTOR SWITCH - This switch is used to reconnect the generator to the proper output voltage. Caution, this switch must never be changed while the unit is running.

B. ENGINE/GENERATOR CONTROL - See below for complete control panel layout and description.

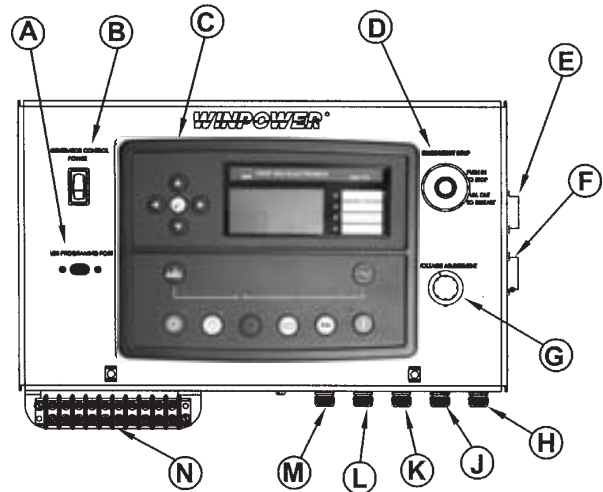
C. CUSTOMER DC INTERCONNECTIONS - All customer DC connections are located under this access panel. See page 7 for additional details.

D. FULL POWER AC CONNECTIONS - Full power terminal blocks for AC output are located behind this door. See page 6 for additional information.

E. MAIN LINE CIRCUIT BREAKER - Adjustable mainline circuit breaker. This breaker system is designed to give you the proper breaker protection in all three voltage positions on the selector switch. When selecting the output voltage you must also adjust this breaker. Additional information is provided later in the manual. Note the DX90 -DX130 has a two breaker system on it, one for high voltage (480) and one for low voltage (208 & 240).

ENGINE CONTROL PANEL LAYOUT

A. USB PROGRAMMING PORT - USB port for computer interface. Used for programming the DSE7310 controller.



B. GENERATOR CONTROL POWER - Battery disconnect switch for engine control. Used during long term storage to prevent battery discharge

C. DSE7310 CONTROLLER - See controller explanation on follow page.

D. Emergency Stop Switch - When depressed this switch will disconnect all the 12 volt power to the DSE7310 shutting the engine down. The display on the controller will annunciate "Emergency Stop".

E. AC INTERFACE CONNECTOR - This connector is used to interface with the AC generator end. It provides the controller with the voltage, amperage and frequency reading for the display.

F. DC INTERFACE CONNECTOR - This connector provides all the interface connections for the engine. Including the DC power supply to operate the DSE7310 controller. Engine CAN connections are also made through this connector providing the controller with the engine operational reading.

G. VOLTAGE ADJUSTMENT - This rheostat is used to fine tune the AC output voltage after changing the voltage selector switch.

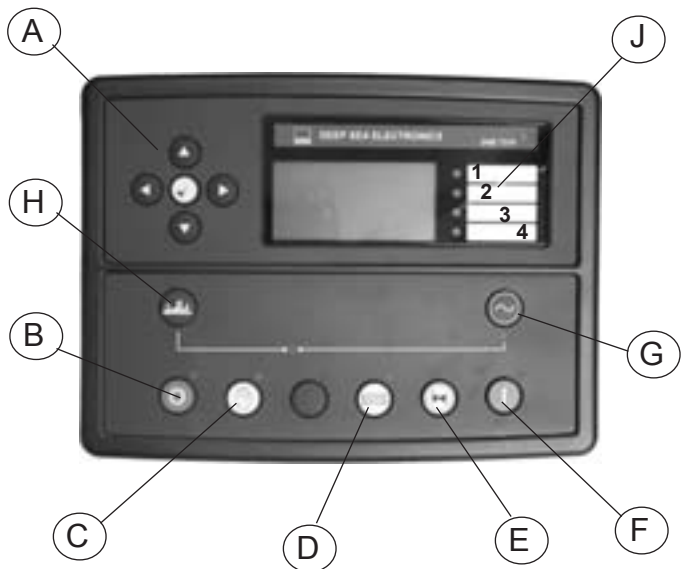
H. 10 AMP FUSE - This fuse supplies the DSE7310 controller 12 Volt DC for all controller switching functions. (Replacement AGC-10A-250V)

J. 3 AMP FUSE - This fuse supplies the 12 volt DC to power the DSE7310 controller circuitry on the board. (Replacement AGC-3A-250V)

K, L, M. 2 AMP FUSE - These fuses are in the AC input line from the generator. These are the feeds that provide the AC voltage reading on the display. If one of these is blown the controller will not show the proper voltage on one leg and may shutdown for low voltage. (Replacement AGC-2A-250V)

N. CUSTOMER DC INTERCONNECTIONS - See page 7 for Additional details.

DSE 7310 Series CONTROLLER



A. MENU NAVIGATION BUTTONS – Left and Right buttons select different groupings (i.e. Engine reading, Generator reading, etc.) Up and down buttons scroll through the different readings for each group.

B. STOP/RESET – This button places the module into its STOP/RESET mode. This will clear an alarm conditions for which the triggering criteria have been removed. If the engine is running and this button is pushed the module will shut off the fuel solenoid and the engine will come to a stop. If a remote start signal is received while this switch is activated, the unit will not start.

C. MANUAL - This mode allows manual control of the generator functions. Once in the MANUAL mode the module will allow you to start the unit using the START button. The unit will continue to run until either the STOP/RESET or AUTO button is pressed. If the unit receives a remote start signal during manual operation, the generator will remain running even after the remote start signal has been lost. You must use the STOP/RESET or AUTO button to stop the unit once you have started it in manual mode.

**** CAUTION ****

IF THE POWER FAILS WHILE RUNNING IN THE MANUAL MODE THE TRANSFER SWITCH WILL TRANSFER THE LOAD TO THE GENERATOR. TO PREVENT THIS THE MAIN-LINE CIRCUIT BREAKER ON THE GENERATOR MUST BE OPENED.

D. AUTO – This button places the module into its AUTOMATIC mode. This module will monitor the remote start input for a relay closure. When the remote start signal is received it will time out the start delay (5 Seconds) and then start the engine generator set. When the remote start signal is lost (relay opened up) the module will shut the engine generator set down after the cool down timer has timed out. The module will return to the auto start mode and await the next start signal.

E. LAMP TEST/HORN RESET - This button silences the audible alarm if it is sounding and illuminates all of the LEDs as a lamp test feature. When configured and fitted to a compatible engine ECU, pressing this button in STOP/RESET mode after pressing the START button (to power the ECU) will cancel any "passive" alarms on the engine ECU.

F. START – This button is active only in the MANUAL or STOP/RESET mode. Pressing this button in the MANUAL mode will start the engine locally for testing. The engine will continue to run until either the STOP/RESET or the AUTO button is pressed. Pressing this button with the control in the STOP/RESET mode will turn on the CAN engine ECU (when correctly configured and fitted to a compatible engine ECU).

G. CLOSE GEN-SET – NOT USED IN THIS APPLICATION

H. OPEN GEN-SET – NOT USED IN THIS APPLICATION

J. PANEL LED'S –

1. Remote Start.
2. Low Fuel
3. Generator Available
4. Emergency Stop

NOTE: STOP/RESET, MANUAL mode and AUTO mode buttons all have indicator lamps next to them to tell you what mode you are in. Pressing buttons out of sequence will cause the engine not to function properly. See button operation sequencing above.

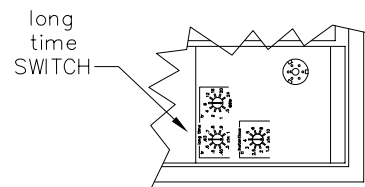
SELECTING THE CORRECT VOLTAGE

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

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 kill 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. See the diagram below for proper adjustments. DX90 - DX130 have a two breaker system installed on them, you must ensure the correct breaker is turned closed.

SELECTOR SWITCH POSITION	VOLTAGE /PHASE	long time SETTING
277/480	480/3	.32
120/240	240/3	.66
120/208	208/3	.76



If you have any doubts as to the voltage in your area compare your incoming power or load name plates to the voltage table below.

1. 120/240 Volt Three Phase* (Delta/Series configuration) - This configuration will produce the following line-to-line and line-to-neutral voltage. In this selector switch position, all of the receptacles on the front panel are powered.

G1 - G2 - G3	240 Volts three phase
G1 - G2	240 Volts single phase
G2 - G3	240 Volts single phase
G1 - G3	240 Volts single phase
G1 - N	120 Volts
G2 - N	208 Volts
G3 - N	120 Volts

WARNING - POTENTIAL EQUIPMENT DAMAGE

THIS DELTA CONFIGURATION HAS A WILD LEG THAT PRODUCES 208 VOLTS 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 120 VOLT DEVICES RECEIVING 208 VOLTS. YOU MUST ALSO MATCH YOUR ROTATION.

* 120/240 Volt Single Phase output also uses this switch position. When connecting for single phase the wild leg of the 120/240 volt three phase connection is not used (G2).

G1 - G3	240 Volts single phase
G1 - N	120 Volts
G2 - N	NOT USED
G3 - N	120 Volts

2. 120/208 Volt Three Phase (Low/Parallel WYE configuration) This configuration will produce the following line-to-line and line-to-neutral voltage. Use of this selector switch position allows utilization of the 120 volt receptacle only. The 240 volt receptacles cannot be used as the voltage at them is only 208 volts.

G1 - G2 - G3	208 Volts three phase
G1 - G2	208 Volts single phase
G2 - G3	208 Volts single phase
G1 - G3	208 Volts single phase
G1 - N	120 Volts
G2 - N	120 Volts
G3 - N	120 Volts


3. 277/480 Volt Three Phase (High/Series WYE configuration) This configuration will produce the following line-to-line and line-to-neutral outputs.

NOTE - CONVENIENCE RECEPTACLES THE 120 OR 240 VOLT RECEPTACLES ARE DISCONNECTED WITH THE SELECTOR SWITCH IN THIS POSITION

G1 - G2 - G3	480 Volts three phase
G1 - G2	480 Volts single phase
G2 - G3	480 Volts single phase
G1 - G3	480 Volts single phase
G1 - N	277 Volts
G2 - N	277 Volts
G3 - N	277 Volts

A.C. ELECTRICAL CONNECTIONS

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

Note: This symbol  always indicates ground where shown.

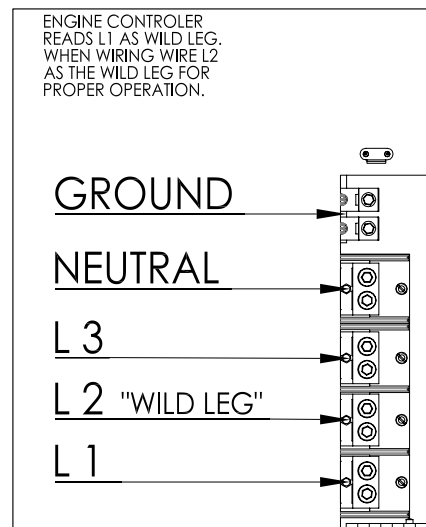
All wiring must be completed in accordance with the National Electrical Code as well as any state or local codes. To select the proper conductor size between the generator and the load, first look your model up in Table of Appendix "1" for your generator amperage. Then refer to Appendix "2" for guidance on wire sizing based on both wire type and amperage. Wire amperages have been derated for 40° C ambient temperatures operation.

For additional information on wire sizing refer to table 310-16 of the National Electrical Code ANSI/NFPA 70.

****** WARNING ******

A main line 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 operation switch is in the OFF position.

This AC terminal block is covered by a lockable access cover (see ref "D" on page 5). 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 the receptacles located here have their own circuit breaker for protection. Ground Lugs - These ground lugs will handle wire sizes from #6 to 250 MCM and should be torqued to 275 in. lbs. Two lugs are provided for your use. These ground lugs are grounded to the generator frame.



Neutral Lug - These neutral lugs will handle wire sizes from #4 to 500 MCM and should be torqued to 375 in. lbs. Two lugs are provided for your use. These neutral lugs are isolated from the generator frame.

L1, L2 & L3 Power Output Lugs - These lugs will handle wire sizes from #4 to 500 MCM and should be torqued to 375 in. lbs. Two lugs per generator output leg are provided for your use. These lugs are isolated from the generator frame.

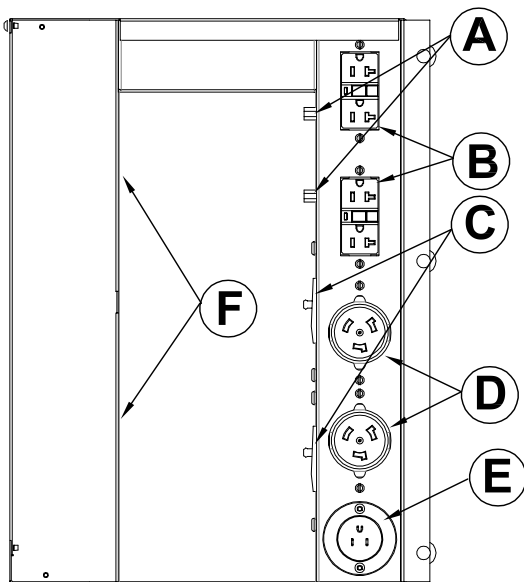
In the 120/240 volt three phase configuration the wild leg (208 line to neutral) is wired to the L2 position. ALSO NOTE THAT BECAUSE OF A CONFIGURATION PROBLEM THE DEEP SEA CONTROL WILL SHOW THE WILD LEG ON L1 BUT IT IS WIRED TO THE L2 POSITION.

 **** **WARNING** ****

PERSONAL DANGER - This unit was shipped with the neutral and ground unbonded. If the unit is to be used as a stand-a-lone 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.



RECEPTACLE PANEL

A. CIRCUIT BREAKER 20 AMP - 2-20 amp circuit breakers provide circuit breaker protection for the 2-20 amp GFCI 120 Volt receptacles.

B. 20 AMP/120 VOLT GFCI RECEPTACLE - These 2-20 amp GFCI protected receptacles are powered only when the selector switch is in the 240 or the 208 volt position. They are dead when the voltage selector switch is in the 480 Volt position. (NEMA 5-20R)

C. CIRCUIT BREAKERS 50 AMP - 2-50 amp circuit breakers provide circuit breaker protection for the 2- 50 amp 120/240 Volt twistlock receptacles.

D. 50 AMP/120/240 VOLT TWISTLOCK RECEPTACLE - 2-50 amp receptacles are powered only when the selector switch is in the 240 or the 208 volt position. They are dead when the voltage selector switch is in the 480 Volt position. These two receptacles are 4 wire 120/240 volt. (The mating plug is a Hubble CS6365)

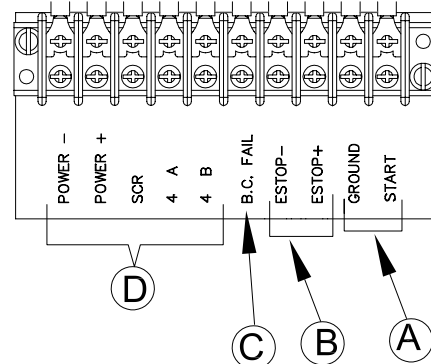
E. 15 AMP 120 VOLT REVERSE PLUG - This plug is provide to power the block heater and the battery charger mounted inside the unit when the unit is used for standby. It also allows battery charging during periods of long term storage.

D.C. ELECTRICAL CONNECTIONS

All DC connections are completed on the terminal strip just below the engine control. All DC connections **must be run in separate conduit**. You can not mix AC and DC leads in the same conduit.

CONNECTION BOX TERMINALS

Wire size requirements for each of the connections may vary but terminal lugs should be used for all connections. Torque spec for terminal lugs is 9 in. lbs.



A - Customer Remote Start CONNECTIONS TERMINALS. The two remote start leads from the Automatic Transfer Switch are connected to the two terminals marked Ground & Start. The wire in terminal labeled 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 to go into an auto-start mode and start up the engine generator.

Depending on the distance, 14 to 16 gauge stranded wire should be used. It is suggested that these wires be labeled S1 and S23. 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 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.

B - 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..

C. - Battery Charger Failure. Battery charger failure relay input from remote battery charger to DSE7310 controller.

D - Remote Display Panel Interface Terminals. These interface terminals are prewired to allow for the connection of a remote display. This display allows for the remote annunciation of alarms at a location such as a nurses station or a control room. This display can be used to meet the remote annunciation requirements of NFPA 110 standards. (This feature meets the annunciation requirements in applications requiring NFPA110 level one protection.)

**** **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.

INSTALLING THE BATTERY

**** CAUTION ****

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

A customer supplied twelve-volt battery is required to complete the installation; 24 volt systems require 2 batteries. 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.

See the specification listing in appendix 1 for the correct battery size and minimum CCA rating for the different models.

Installation and servicing of batteries must be performed or supervised only 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

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

CAUTION -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.
3. 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 cable first and then the positive cable.
4. Be sure all connections are tight and coat the terminals and cable ends with dielectric grease.

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

- * Always wear full eye protection and protective clothing
- * Where electrolyte contacts the skin, wash off immediately with water
- * If electrolyte contacts the eyes, flush thoroughly and immediately with water and seek immediate medical attention
- * 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

- * Never smoke when near batteries
- * Do not cause a flame or spark in the battery area
- * Always discharge static electricity from your body before touching batteries by first touching a grounded 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. When refilling the battery with water use only distilled water. Tap water will shorten the service life of the battery.

Never fill the battery above the fill line. Over filling above the upper level line may cause the electrolyte to overflow, resulting in corrosion to the engine or nearby parts. Immediately wash off any spilled electrolyte following the procedure above.

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. Check the electrolyte (fluid) in the battery periodically to be sure it is above the plates. Never allow the battery to remain in a discharged condition.

BATTERY CHARGER & BLOCKHEATER

A two-stage battery tender is provided for all standby generators. These battery chargers can vary depending on what model you have purchased and what the original specifications call for. For units operating at 12 volts D.C. the standard charger is a battery tender that charges at a rate of 2 amps until the battery is fully charged and then automatically switches to a 13.2 VDC float charger.

** NOTICE **

The trickle charger is not intended to recharge a battery which has become completely discharged. It is designed to produce just enough current to maintain a fully charged battery.

The battery tender receptacle is to be powered by a GFCI circuit and installed in accordance with the United States National Electric Code. It is suggested that this circuit be fused for 20 amps, depending on. Then both the battery charger and the block heater can be connected to the same circuit. The engine block heater installed on this unit should also be plugged in to this 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 (A.T.S.)

**** **WARNING** ****

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

INSTALLATION NOTES

Because of the 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 A.T.S. Control and safety systems will eliminate all paths for feedback.

To wire the automatic transfer switch into the existing wiring, first determine which circuits will be on the emergency load circuit. If the entire load is to be transferred, the transfer switch can be wired in directly after the 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 A.T.S. 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.

INITIAL START UP

**** **WARNING** ****

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:

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

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

STARTING PROCEDURE

MANUAL MODE

**** **WARNING** ****

EQUIPMENT DAMAGE - BEFORE ATTEMPTING TO START THIS UNIT COMPLETE YOUR PRESTART CHECKLIST AND INSURE 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.

1. Depress the manual mode button on the control panel. The small LED light next to it should come on.
2. Press the "START" button- The DSE7310 will send a start signal to the ECU on the engine. The engine ECU will then energize the fuel solenoid and start the cranking cycle (10 seconds on and 15 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'.

3. All engine functions are controlled by the ECU on the engine. The ECU on the engine will send information signals to the DSE7310 via the CAN connections to indicate oil pressure, water temperature, etc for the display on the engine control. All shutdown functions are also controlled by the ECU on the engine, what you see displayed on the DSE7310 display is what is happening inside the ECU on the engine.

The AC output readings displayed on the DSE7310 are collected through the AC interface harness wired in the generator control box. An shutdowns related to the AC output are not a function of the engine ECU but are based on information collected in the DSE7310 via this AC harness.

4. During manual operation the load will not normally be applied to the generator. But caution must be used, if the line power should fail or be turned off to the transfer switch during manual operation the load may be applied to the generator.

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 58.5 To 62 hertz (Hz).

If you have the proper voltage at the generator the next step is to check the voltage at the generator terminals in the Automatic Transfer Switch. The voltage between the G1 and the G3 terminals should be the same as it was on the generator front panel. The voltage should also be checked between the hot terminals (G1 and G3) and the G-N to be certain of a balanced voltage output and a solid neutral connection. The voltage between G1 and G-N should be about 120 volts AC (277 on 480 units). The same approximate voltage should be found between terminals G3 and G-N (120 volts AC).

On three phase panels the G2 voltage level should also be checked. **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.** (i.e. if it's on L-3 on the line side it must be on G-3 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.

5. 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

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 start mode.

To test the automatic start Transfer Switch follow the instruction in the operator's manual you received with your transfer switch. If you get a fault light 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 standby mode unless servicing the unit. For standby operation, press the AUTO button on the front of the engine control. The green light should light up next the AUTO button.

TROUBLESHOOTING TABLES

Note: Before doing any troubleshooting, check the digital display on the DSE7310. Normally it will tell why the unit has failed. This will shorten your troubleshooting time and in many cases prevent the replacement of parts that may not be defective.

UNIT WILL NOT CRANK WHEN THE POWER FAILS

1. Digital Genset Controller not in "AUTO"
2. Transfer control switch not in "AUTOMATIC" position.
3. Incorrect wiring between transfer switch and generator.
4. Defective control relay in the transfer switch.
5. Fuse (s) blown in the Digital Genset Controller.
6. Defective Digital Genset Controller
7. Loose or dirty battery terminals.
8. Defective starter.
9. Defective start solenoid.
10. Dead Battery.

ENGINE WILL NOT CRANK WITH GENERATOR START-BUTTON DEPRESSED

1. Battery dead.
2. Blown DC fuses on the Digital Genset Controller tripped.
3. Defective Digital Genset Controller.
4. Loose or dirty battery terminals.
5. Defective "Run/Auto" switch on generator.
6. Defective starter.
7. Defective start solenoid.
8. Locked up engine genset.

ENGINE CRANKS BUT WILL NOT START

1. Improper fuel delivery to the unit.
2. Fuel supply shut off.
3. Fuel tank empty.
4. Air in the injection system.
5. Engine fuel rack has not opened.
6. Defective CANBus on the engine.

ENGINE STARTS AND THEN STOPS AND ALARM LIGHT COMES ON

1. Engine is low on oil.
2. Engine has high water temperature.
3. Engine has overspeed.
4. Engine has gone into overcrank.
5. No output from AC generator.
6. Loss of speed signal.
7. Loss of run signal.

ENGINE WILL NOT COME UP TO SPEED AFTER IT STARTS

1. Insufficient fuel volume getting to the unit.
 - a. Too small of fuel line.
 - b. Fuel racks not opened properly
2. Governor is defective.
3. AC short in generator components.

ATS PANEL WILL NOT TRANSFER TO EMERGENCY SUPPLY (GENERATOR)

1. No AC generator output from generator.
2. Defective ATS control board. See applicable transfer switch manual .
3. Circuit breaker between generator and transfer switch is either open or defective.

ATS PANEL WILL NOT RETRANSFER TO NORMAL POWER

1. Proper normal line power not available at line terminals in ATS panel.
2. Defective ATS control board. See applicable transfer switch manual .

NO AC OUTPUT FROM GENERATOR

1. Defective diode.
2. Defective voltage regulator.
3. Defective rotor.
4. Defective stator.
5. Defective exciter rotor.
6. Defective exciter stator.
7. AC short in the output leads.
8. Defective field circuit breaker.
9. Wiring error.

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APPENDIX 1

SPECIFICATIONS TABLES

<u>MODEL</u>	<u>WATTS</u>	<u>VOLTS</u>	<u>PF</u>	<u>AMP</u>	<u>HZ</u>	<u>PH</u>	<u>ENGINE</u> <u>MODEL</u>	<u>ENGINE</u> <u>VOLTAGE</u>	<u>BATTERY</u> <u>BCI/CCA</u>	<u>FULL LOAD</u> <u>FUEL REQ.²</u>
DX90I4-X	44,880	120/240	1.0	187 ¹	60	1	IVECO NEF45 TM2X	12 VOLTS	31/900	6.9 GAL
	90,000	120/208	0.8	312	60	3	IVECO NEF45 TM2X	12 VOLTS	31/900	6.9 GAL
	90,000	120/240	0.8	270	60	3	IVECO NEF45 TM2X	12 VOLTS	31/900	6.9 GAL
	90,000	277/480	0.8	135	60	3	IVECO NEF45 TM2X	12 VOLTS	31/900	6.9 GAL
DX130I4-X	52,320	120/240	1.0	218 ¹	60	1	IVECO NEF67 TE1X	12 VOLTS	31/900	7.7 GAL
	105,000	120/208	0.8	364	60	3	IVECO NEF67 TE1X	12 VOLTS	31/900	7.7 GAL
	105,000	120/240	0.8	315	60	3	IVECO NEF67 TE1X	12 VOLTS	31/900	7.7 GAL
	115,000	277/480	0.8	172	60	3	IVECO NEF67 TE1X	12 VOLTS	31/900	7.7 GAL
DX100I4-X	72,480	120/240	1.0	302 ¹	60	1	IVECO NEF67 TE1X	12 VOLTS	31/900	8.8 GAL
	130,000	120/208	0.8	450	60	3	IVECO NEF67 TE1X	12 VOLTS	31/900	8.8 GAL
	130,000	120/240	0.8	390	60	3	IVECO NEF67 TE1X	12 VOLTS	31/900	8.8 GAL
	130,000	277/480	0.8	195	60	3	IVECO NEF67 TE1X	12 VOLTS	31/900	8.8 GAL
DX175I4-X	94,800	120/240	1.0	395 ¹	60	1	IVECO NEF67 TE2X	12 VOLTS	4D/1200	12.4 GAL
	175,000	120/208	0.8	607	60	3	IVECO NEF67 TE2X	12 VOLTS	4D/1200	12.4 GAL
	175,000	120/240	0.8	525	60	3	IVECO NEF67 TE2X	12 VOLTS	4D/1200	12.4 GAL
	175,000	277/480	0.8	263	60	3	IVECO NEF67 TE2X	12 VOLTS	4D/1200	12.4 GAL
DX200D4-X	107,280	120/240	1.0	447 ¹	60	1	DEUTZ BF4M1013FC	12 VOLTS	4D/1200	13.0 GAL
	200,000	120/208	0.8	694	60	3	DEUTZ BF4M1013FC	12 VOLTS	4D/1200	13.0 GAL
	200,000	120/240	0.8	600	60	3	DEUTZ BF4M1013FC	12 VOLTS	4D/1200	13.0 GAL
	200,000	277/480	0.8	300	60	3	DEUTZ BF4M1013FC	12 VOLTS	4D/1200	13.0 GAL
DX300I4-X	160,920	120/240	1.0	671 ¹	60	1	IVECO CUSSOR 10TE1D	24 VOLTS	(2) 4D/1200	21.3 GAL
	300,000	120/208	0.8	1042	60	3	IVECO CUSSOR 10TE1D	24 VOLTS	(2) 4D/1200	21.3 GAL
	300,000	120/240	0.8	903	60	3	IVECO CUSSOR 10TE1D	24 VOLTS	(2) 4D/1200	21.3 GAL
	300,000	277/480	0.8	452	60	3	IVECO CUSSOR 10TE1D	24 VOLTS	(2) 4D/1200	21.3 GAL

Notes 1 - The single phase amperage shown is with the selector switch in the 120/240 three phase position. Amperage is limited to the equivalent of the amperage available in three phase.

Note 2 - Fuel requirement is shown in gallons/per hour.

Note: De-rate unit power ratings by 3-1/2 % per 1000 feet elevation above sea level.

APPENDIX 2

The table below is based on Table 310.16 in the National Electric Code 2008 Edition

Allowable ampacities of insulated conductors rated 0 through 2000 volts, 75°C through 90°C. Not more than three current-carrying conductors in Raceway, Cable or Earth (Direct Buried). Adjusted for 40°C (104°F) ambient temperature.

Copper 75°C Wire Type: RHW THHW, THW THWN, XHHW USE, ZW	Copper 90°C 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	Aluminum Copper Clad Aluminum 75°C Wire Type: RHW THHW, THW THWN, XHHW USE	Aluminum Copper Clad Aluminum 90°C Wire Type: TBS, SA, SIS, THHN THHW, 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

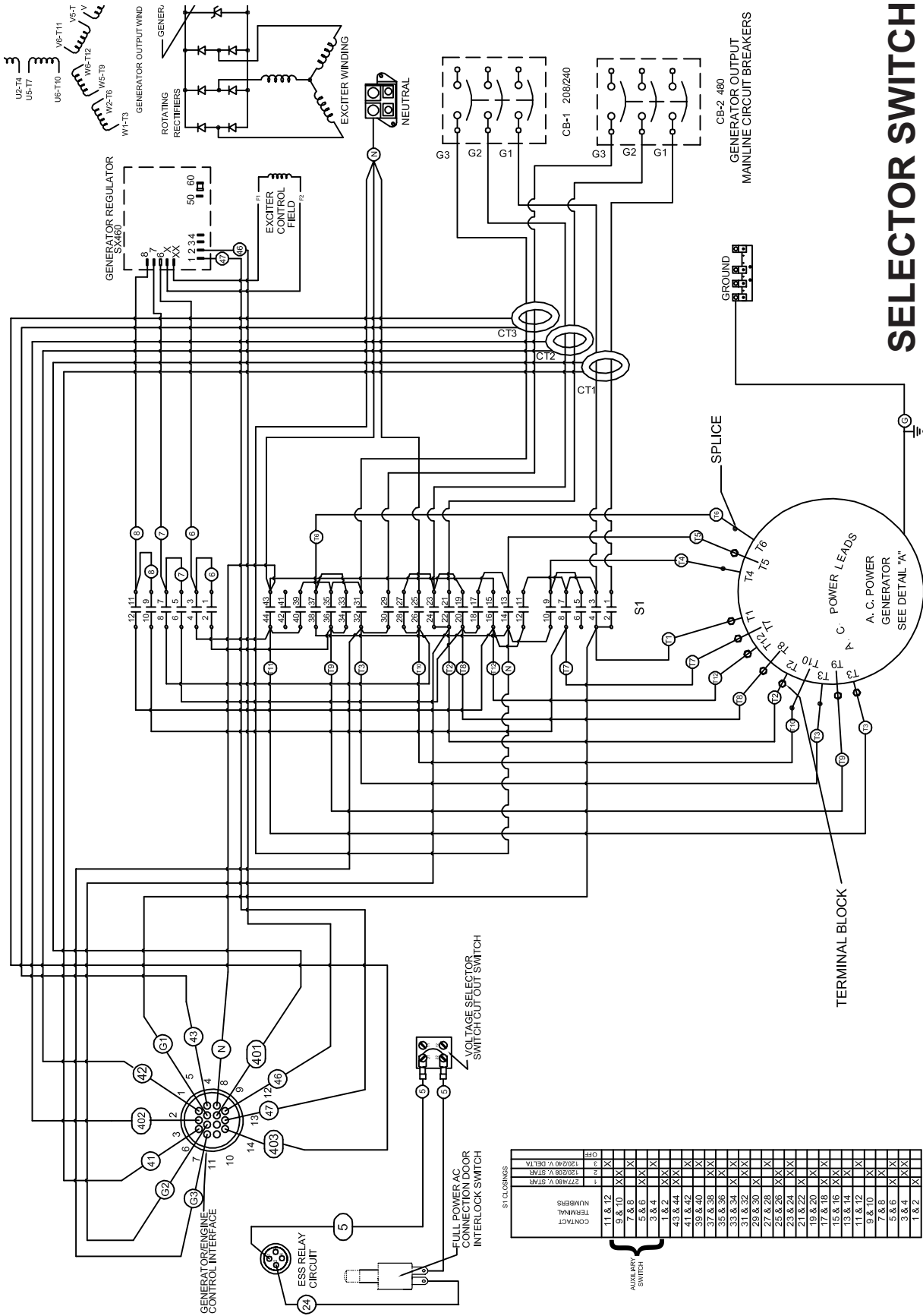
For additional information see table 310.16 of the National Electric Code

APPENDIX 3 WIRING DIAGRAM CROSS REFERENCE

MODEL	WATTS	VOLTS	PHASE	AC CONNECTION DIAGRAM	DC ENGINE CONTROL	ENGINE CONNECTIONS
DX90I4-X	44,880	120/240	SINGLE	PAGE 19	PAGE 22	PAGE 26
	90,000	120/208	THREE	PAGE 20	PAGE 22	PAGE 26
	90,000	120/240	THREE	PAGE 19	PAGE 22	PAGE 26
	90,000	277/480	THREE	PAGE 20	PAGE 22	PAGE 26
DX100I4-X	52,300	120/240	SINGLE	PAGE 19	PAGE 22	PAGE 26
	105,000	120/208	THREE	PAGE 20	PAGE 22	PAGE 26
	105,000	120/240	THREE	PAGE 19	PAGE 22	PAGE 26
	115,000	277/480	THREE	PAGE 20	PAGE 22	PAGE 26
DX130I4-X	72,480	120/240	SINGLE	PAGE 19	PAGE 22	PAGE 26
	130,000	120/208	THREE	PAGE 20	PAGE 22	PAGE 26
	130,000	120/240	THREE	PAGE 19	PAGE 22	PAGE 26
	130,000	277/480	THREE	PAGE 20	PAGE 22	PAGE 26
DX175I4-X	94,800	120/240	SINGLE	PAGE 19	PAGE 22	PAGE 26
	175,000	120/208	THREE	PAGE 20	PAGE 22	PAGE 26
	175,000	120/240	THREE	PAGE 19	PAGE 22	PAGE 26
	175,000	277/480	THREE	PAGE 20	PAGE 22	PAGE 26
DX200D4-X	107,280	120/240	SINGLE	PAGE 20	PAGE 22	PAGE 26
	200,000	120/208	THREE	PAGE 20	PAGE 22	PAGE 26
	200,000	120/240	THREE	PAGE 19	PAGE 22	PAGE 26
	200,000	277/480	THREE	PAGE 20	PAGE 22	PAGE 26
DX300I4-X	161,920	120/240	SINGLE	PAGE 19	PAGE 22	PAGE 26
	300,000	120/208	THREE	PAGE 20	PAGE 22	PAGE 26
	300,000	120/240	THREE	PAGE 19	PAGE 22	PAGE 26
	300,000	277/480	THREE	PAGE 20	PAGE 22	PAGE 26

APPENDIX 4 GENERATOR CROSS REFERENCE

MODEL	BASE P/N	VOLTS	PHASE	WINCO P/N	NEWAGE WINDING MODEL #	WINDING GROUP	GEN. LEADS
DX90I4-X	455090-5XX	SWITCHABLE	THREE	350004-701	UCI274C	311	12
DX100I4-X	455100-5XX	SWITCHABLE	THREE	350004-721	UCI274D	311	12
DX130I4-X	455130-5XX	SWITCHABLE	THREE	350004-710	UCI274F	311	12
DX175I4-X	455175-5XX	SWITCHABLE	THREE	350004-105	UCI274H	311	12
DX200D4-X	455200-5XX	SWITCHABLE	THREE	350004-117	UCI274J	311	12
DX300I4-X	455300-5XX	SWITCHABLE	THREE	350031-3	HCI434C	311	12



SELECTOR SWITCH CONNECTION DIAGRAM DX90, DX100 & DX130

S1 CONTACTS

CONTACT	11 & 12	1	2	3	4	5	6	7	8	9	10	13	14	15	16
AUXILIARY SWITCH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TERMINAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
277M80 V. STAR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
120/240 V. DELTA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11 & 12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9 & 10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7 & 8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5 & 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3 & 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 & 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43 & 44	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39 & 42	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37 & 38	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35 & 36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33 & 34	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31 & 32	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29 & 30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27 & 28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25 & 26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23 & 24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21 & 22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19 & 20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17 & 18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15 & 16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13 & 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11 & 12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9 & 10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5 & 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3 & 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 & 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TERMINAL BLOCK

SPLICE

GENERATOR OUTPUT MAINLINE CIRCUIT BREAKERS

A. C. POWER GENERATOR
SEE DETAIL "A"

POWER LEADS

VOLTAGE SELECTOR SWITCH OUTPUT SWITCH

FULL POWER AC CONNECTION DOOR INTERLOCK SWITCH

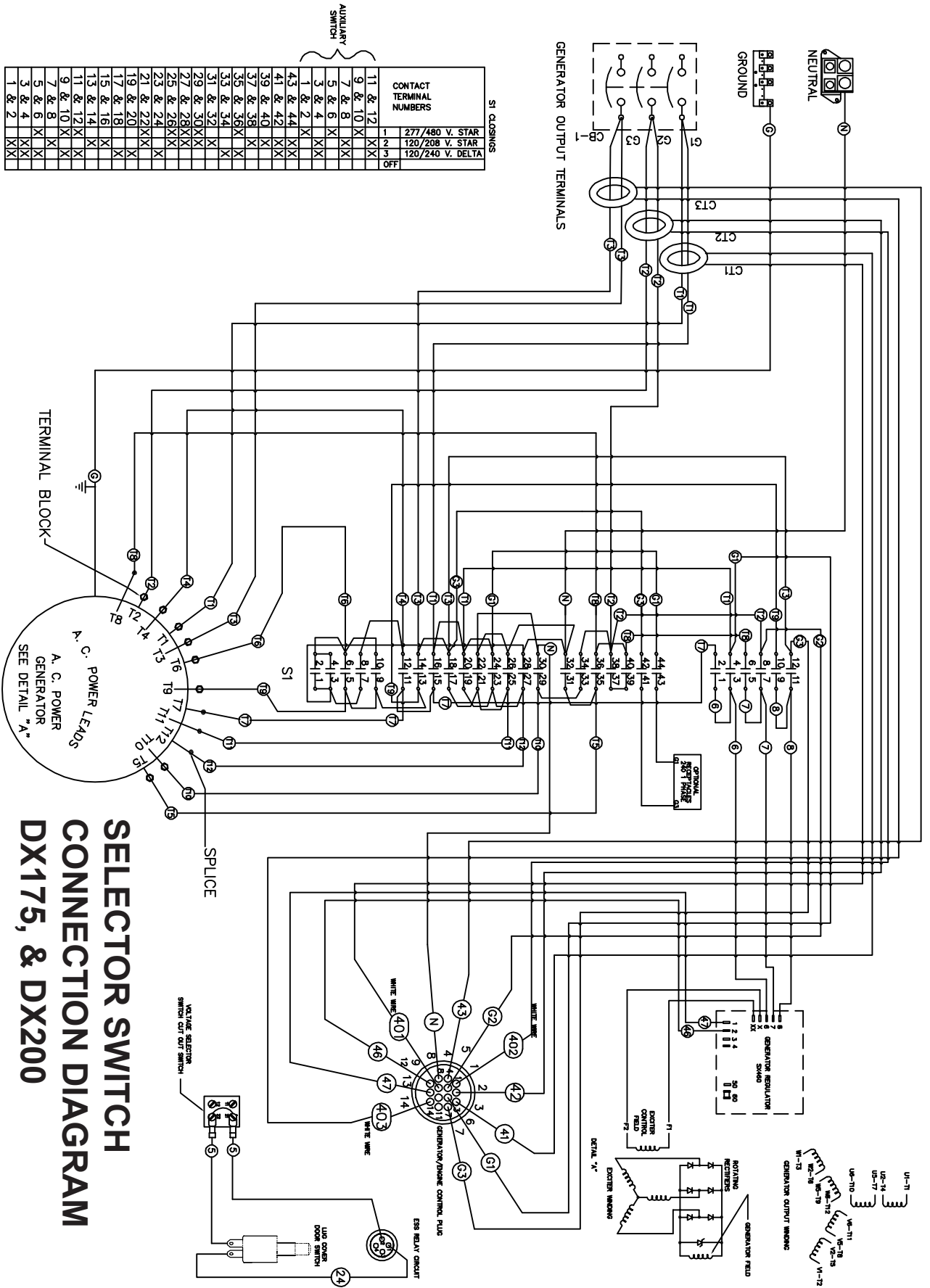
ESS RELAY CIRCUIT

GENERATOR ENGINE CONTROL INTERFAC

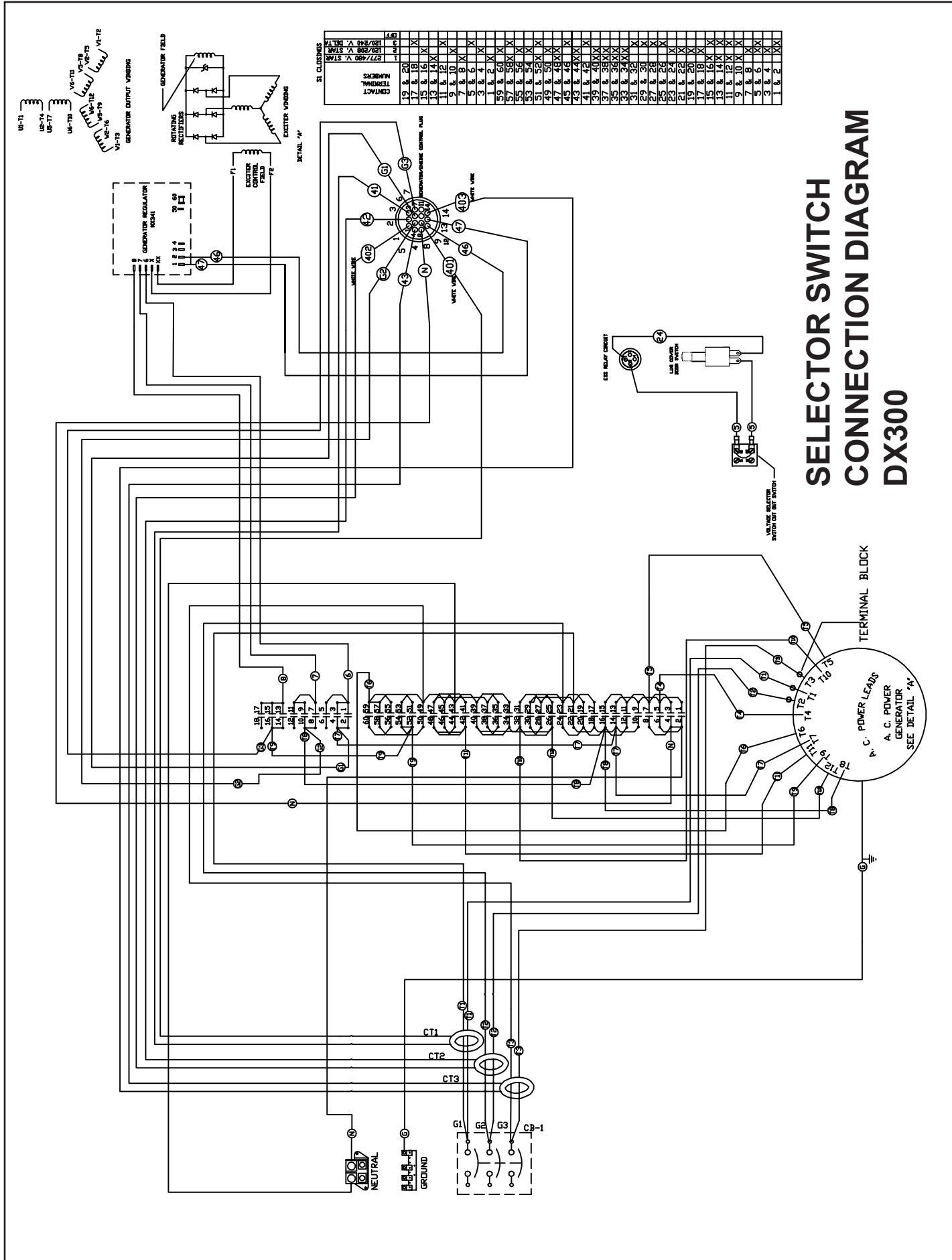
GENERATOR REGULATOR SZ480

EXCITER CONTROL FIELD F1 F2
EXCITER WINDING
ROTATING RECTIFIERS
GENERATOR OUTPUT WIND

U3-T4 U5-T7
U6-T10 V6-T11
W1-T3 W2-T6 W5-T9 W6-T12 V5-T



SELECTOR SWITCH CONNECTION DIAGRAM DX1775, & DX200



SI CLOSINGS

CONTACT TERMINAL NUMBERS	SI STAR
1	187/288 V. STAR
2	187/288 V. STAR
3	187/288 V. STAR
4	187/288 V. STAR
5	187/288 V. STAR
6	187/288 V. STAR
7	187/288 V. STAR
8	187/288 V. STAR
9	187/288 V. STAR
10	187/288 V. STAR
11	187/288 V. STAR
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25	187/288 V. STAR
26	187/288 V. STAR
27	187/288 V. STAR
28	187/288 V. STAR
29	187/288 V. STAR
30	187/288 V. STAR
31	187/288 V. STAR
32	187/288 V. STAR
33	187/288 V. STAR
34	187/288 V. STAR
35	187/288 V. STAR
36	187/288 V. STAR
37	187/288 V. STAR
38	187/288 V. STAR
39	187/288 V. STAR
40	187/288 V. STAR
41	187/288 V. STAR
42	187/288 V. STAR
43	187/288 V. STAR
44	187/288 V. STAR
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90	187/288 V. STAR
91	187/288 V. STAR
92	187/288 V. STAR
93	187/288 V. STAR
94	187/288 V. STAR
95	187/288 V. STAR
96	187/288 V. STAR
97	187/288 V. STAR
98	187/288 V. STAR
99	187/288 V. STAR
100	187/288 V. STAR

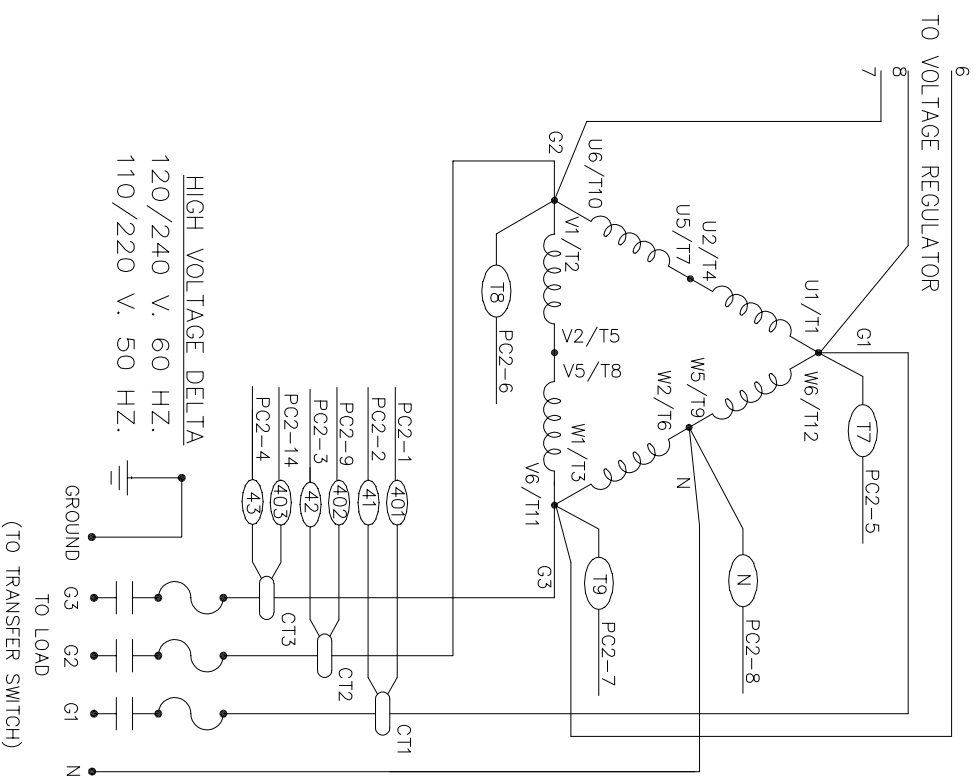
SELECTOR SWITCH CONNECTION DIAGRAM DX300

SINGLE PHASE AC WIRING THREE PHASE AC WIRING - DELTA

**SINGLE PHASE
120/240 VOLTS**

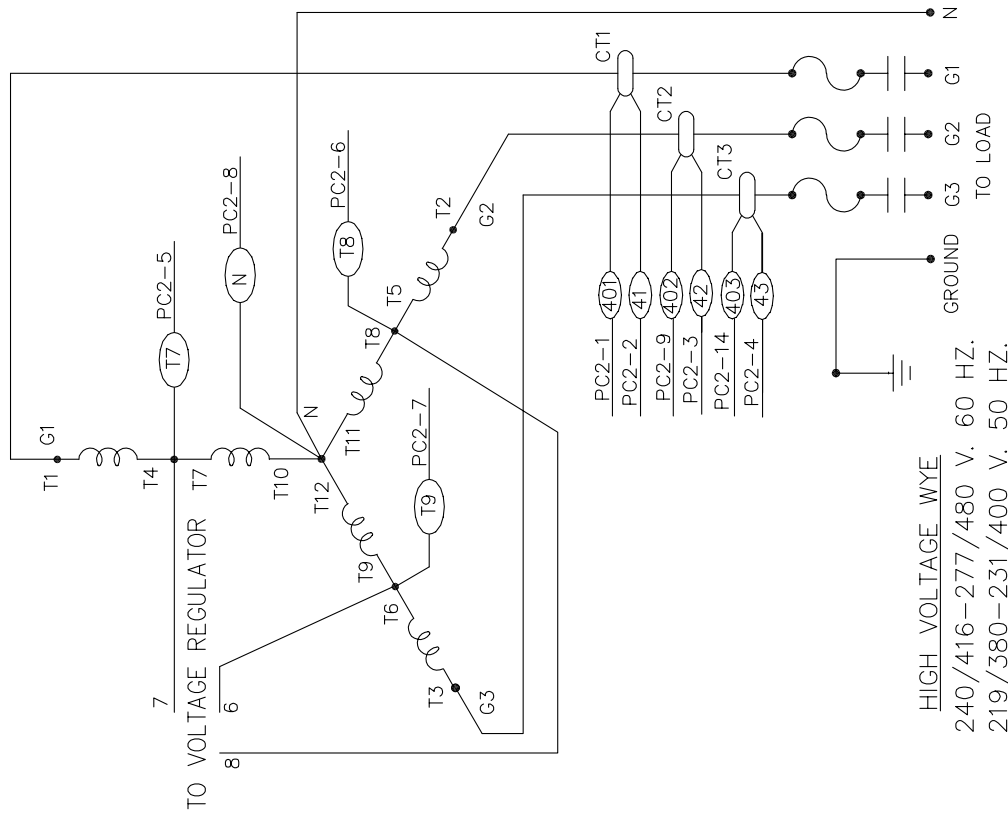
**NOT USED IN THIS APPLICATION
SINGLE PHASE 120/240 IS
PROVIDE VIA THE 1240/240 THREE
PHASE SWITCH POSITION**

**THREE PHASE - DELTA
120/240 VOLTS**

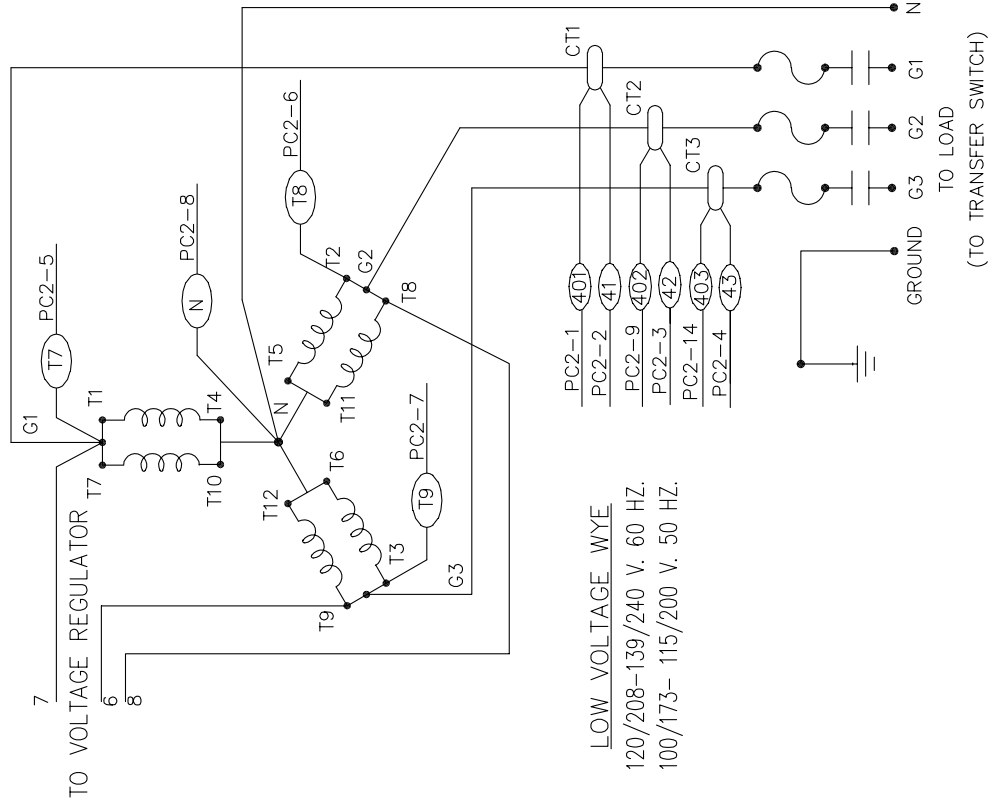


THREE PHASE AC WIRING HIGH & LOW WYE

THREE PHASE - HIGH WYE 277/480 VOLTS



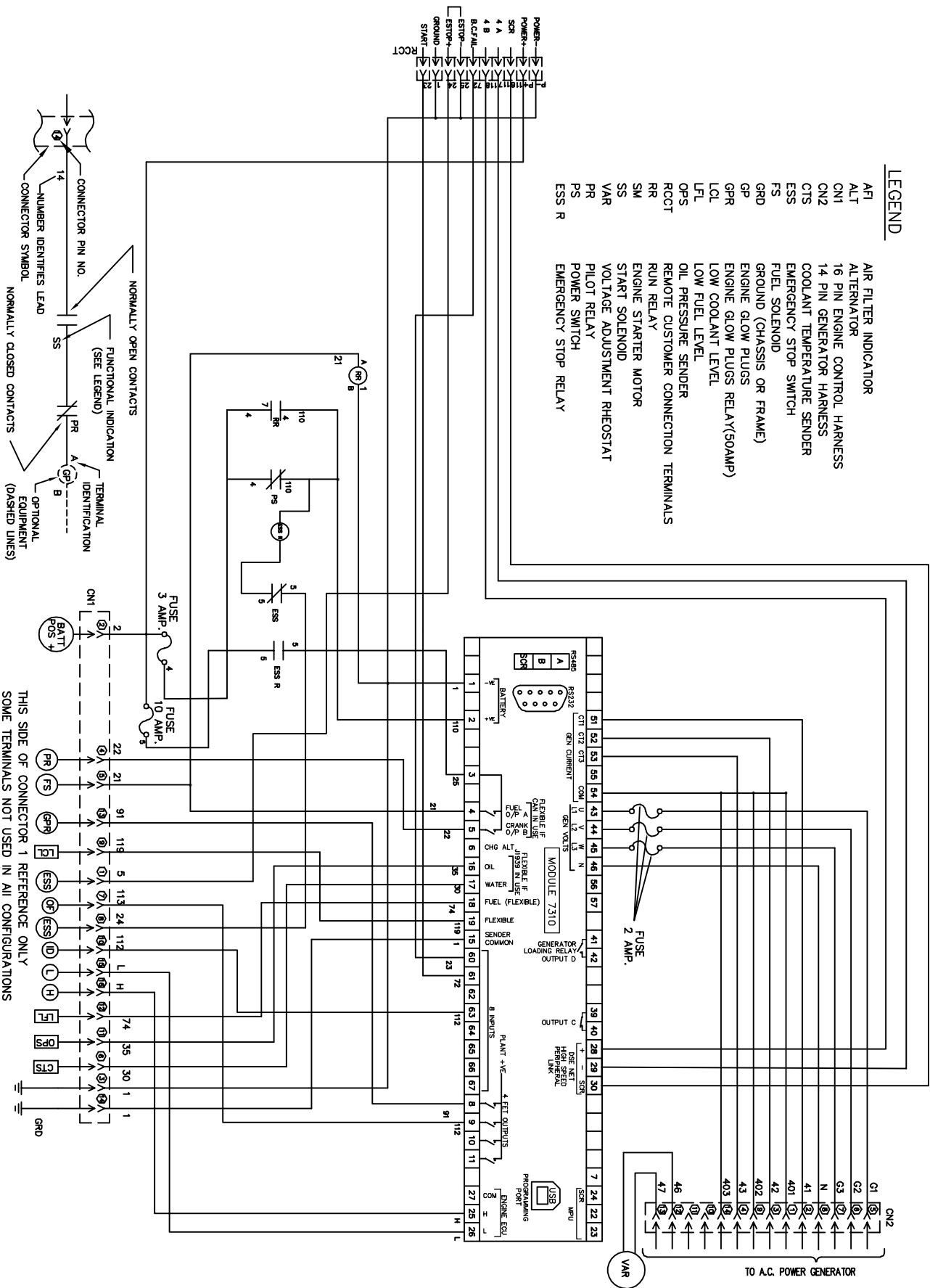
THREE PHASE - LOW WYE 120/208 VOLTS

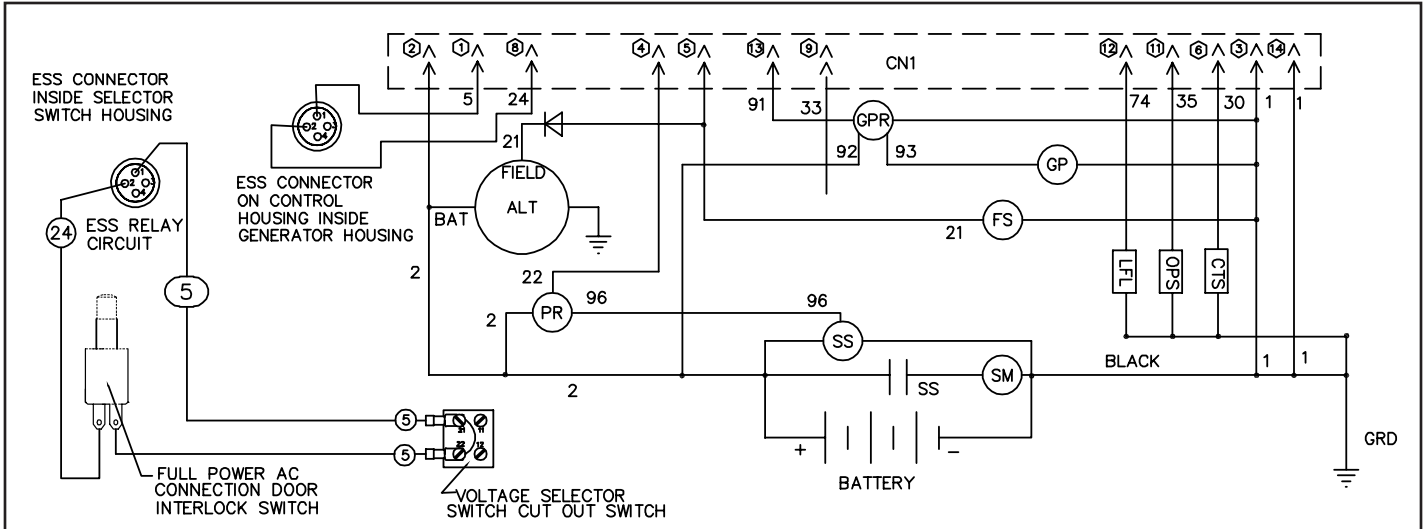


DSE 7310 ENGINE CONTROL WIRING DIAGRAM

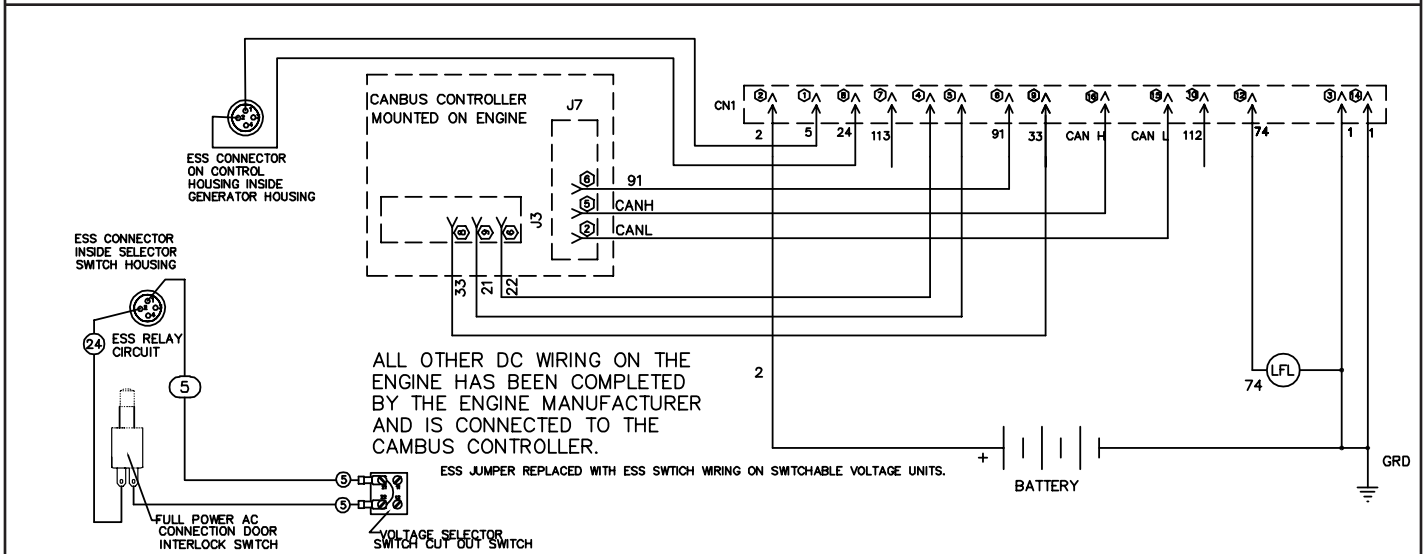
LEGEND

- AFI AIR FILTER INDICATOR
- ALT ALTERNATOR
- CN1 16 PIN ENGINE CONTROL HARNESS
- CN2 14 PIN GENERATOR HARNESS
- CTS COOLANT TEMPERATURE SENDER
- ESS EMERGENCY STOP SWITCH
- FS FUEL SOLENOID
- GRD GROUND (CHASSIS OR FRAME)
- GP ENGINE GLOW PLUGS
- GPR ENGINE GLOW PLUGS RELAY(50AMP)
- LCL LOW COOLANT LEVEL
- LFL LOW FUEL LEVEL
- OPS OIL PRESSURE SENDER
- RCCT REMOTE CUSTOMER CONNECTION TERMINALS
- RR RUN RELAY
- SM ENGINE STARTER MOTOR
- SS START SOLENOID
- VAR VOLTAGE ADJUSTMENT RHEOSTAT
- PR PILOT RELAY
- PS POWER SWITCH
- ESS R EMERGENCY STOP RELAY

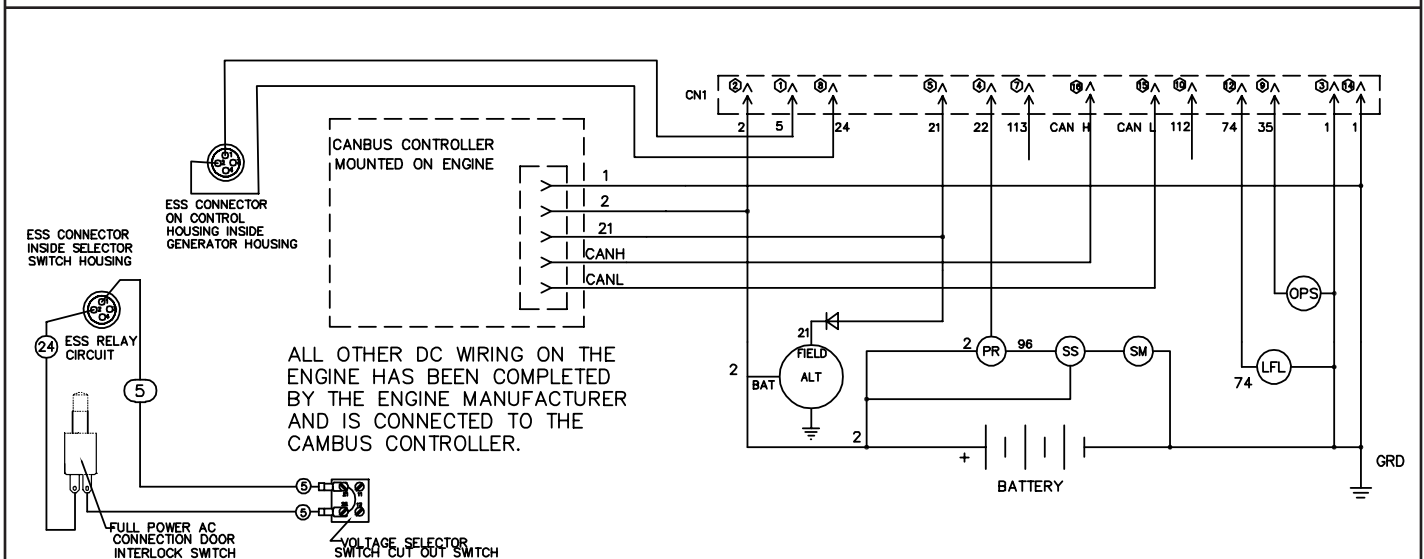




ENGINE WIRING DIAGRAM DX90 - DX130

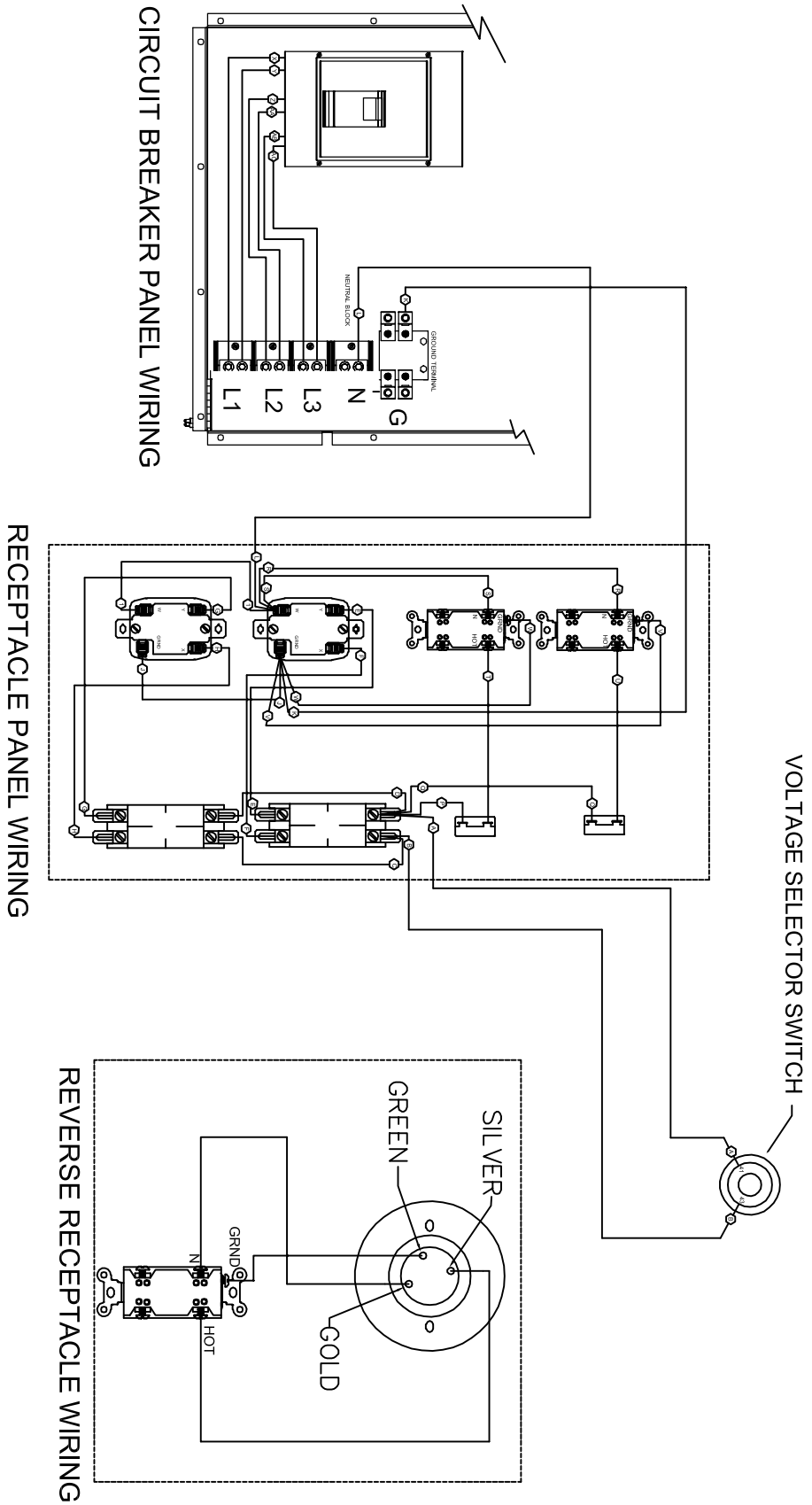


ENGINE WIRING DIAGRAM DX175 - DX300



ENGINE WIRING DIAGRAM DX200

RECEPTACLE WIRING DIAGRAM





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WINPOWER, 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 WINPOWER written instructions.

WINPOWER's sole liability, and Purchaser's sole remedy for a failure under this warranty, shall be limited to the repair of the product. At WINPOWER'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 WINPOWER Authorized Service Center or to WINPOWER, Inc. at Le Center Minnesota.

THERE IS NO OTHER EXPRESS WARRANTY.

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