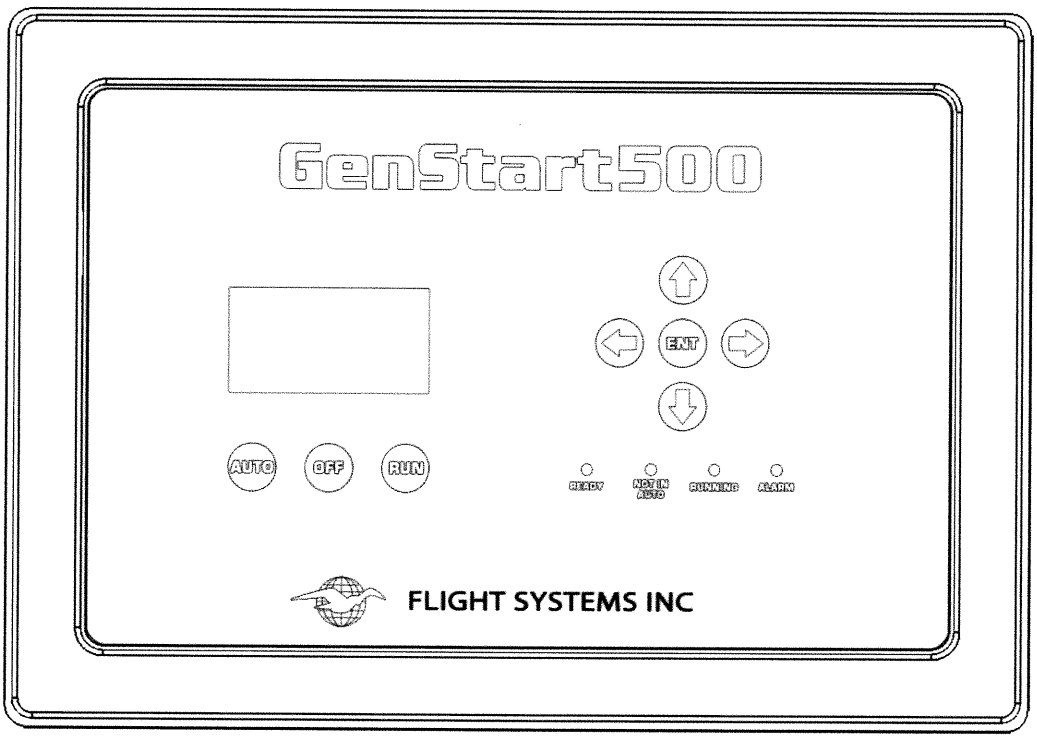
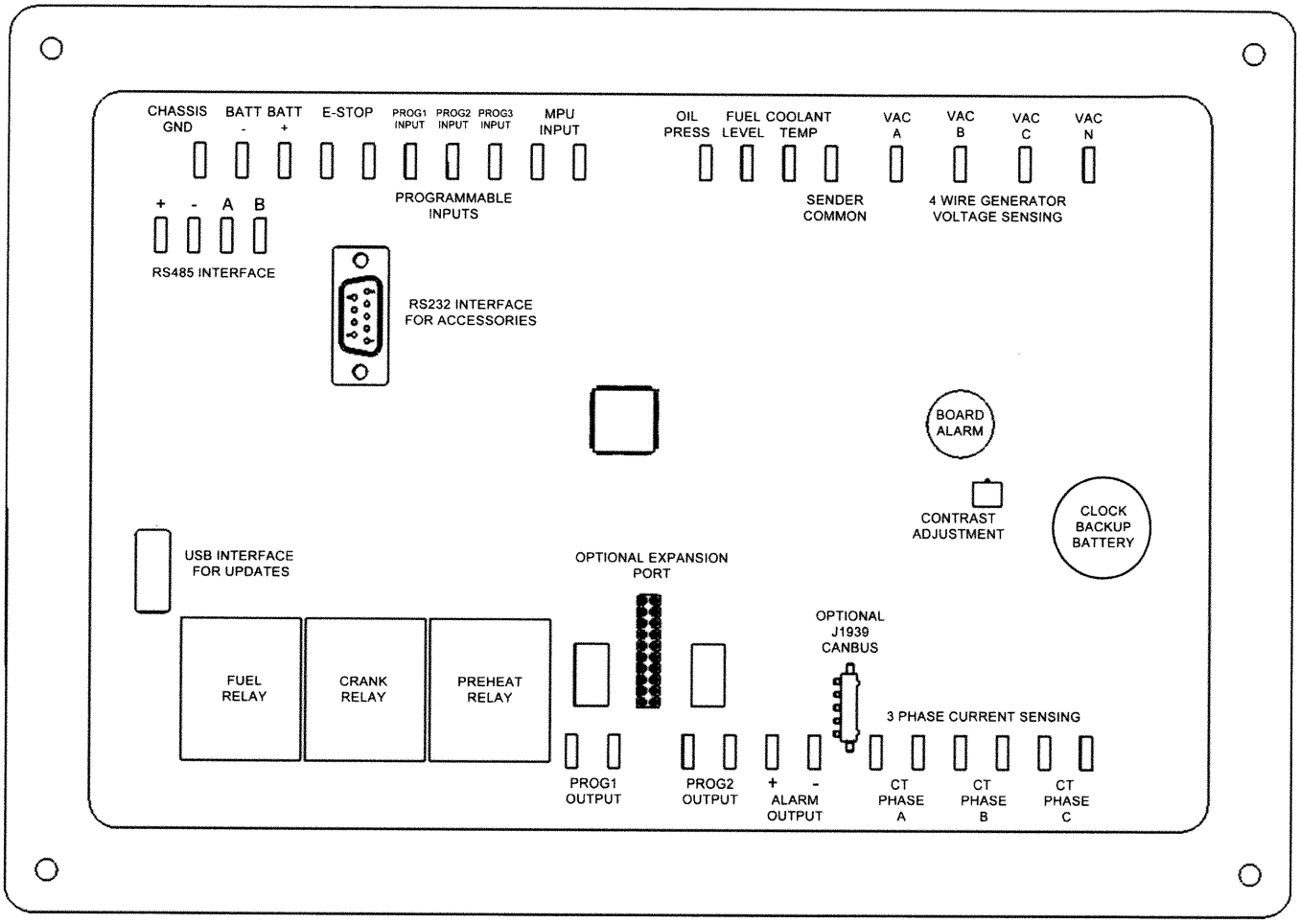
80-DGC-500



STANDBY GENERATOR CONTROLLER

REPLACEMENT FOR
BASLER DGC-500
COLEMAN CP-500
KATOLIGHT KDGC-500

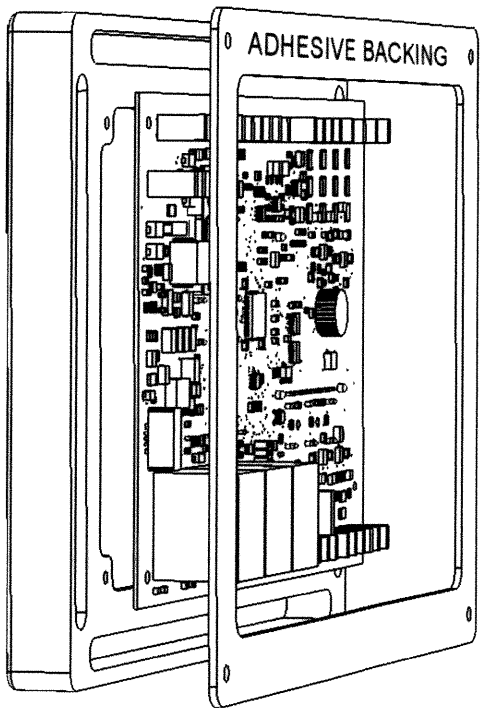
FEATURES



Relay outputs for fuel, start solenoid, and preheat.
2 programmable relays for up 32 unique functions.
Single or 3 phase voltage and current sensing.
Constant current source for oil pressure, fuel level, and coolant temperature transducers.
Magnetic pickup input for RPM.
3 programmable inputs.
External alarm output.
Integrated emergency stop function.
RS485 port for remote annuciation.
RS232 port for accessories, remote notifications.
USB interface for firmware updates and device set up.
Preconfigured sender slopes for common oil pressure, coolant temperature, and fuel level senders.
3 user programmable sender slopes.
Self exercise function with real time clock.
User programmable generator cool down delay.

Optional expansion board for LP level monitor and additional programmable outputs.
Optional J1939 CANBUS interface for engine ECU.

INSTALLATION



Place the included gasket on the 80-DGC-500 controller with the adhesive backing facing the generator panel.

Make sure the generator panel is free of dirt and grease before mounting the controller.

Peel back and remove the white backing to expose the adhesive on the gasket.

Line up the controller with the mounting holes and firmly press the controller into place.

Secure with the 4 included locking nuts.

Reconnect the wiring harness from the removed controller.

CONFIGURATION

This manual will only cover the general settings available and will not go into much detail of each function. For a more in-depth description of the firmware options refer to the release notes for your firmware. Release notes can be found at www.flightsystems.com.

Restore power to the controller. After a brief boot up procedure, the display will show OFF to indicate that the panel is in the OFF position. The current time and firmware version will be displayed. In the top right corner, the wrench icon is highlighted. Press ENT to enter the MAIN MENU. From the MAIN MENU, you can optionally run the set up assistant or manually enter the required parameters by editing each item individually. It is recommended that for a new install you first run the set up assistant to quickly get the most critical settings within safe operating range for your generator. After the set up assistant is complete you can optionally review and adjust each parameter if required.

The MAIN MENU is divided into 8 chapters that are sub-divided by function.

Event Log - View or Clear the event log. The last 50 events are stored in the Event Log.
Communication - Options for CANBUS, RS485, and RS232.
Clock/Exer - Set the real time clock, self exercise, and time totalizer.
SetupAssist - Run the set up assistant.
Engine - Settings for fuel level, battery, oil pressure, temperature, cyclic crank, and speed sensor.
Generator - Voltage, frequency, and current settings for the generator.
USER I/O - Programmable inputs, outputs, sender slopes, and factory defaults.
Calibrate - Calibration points for analog readings.

Highlight **SetupAssist** and push **ENT**. When prompted to run the Set up Assistant, highlight **YES** and push **ENT** to confirm.

SET UP ASSISTANT

Follow the prompts on screen using the UP arrow to increase and the DOWN arrow to decrease settings. Press ENT to continue to the next step.

1. Enter the nominal RPM. Typically 1800 or 3600 RPM.

2. Enter the Flywheel Teeth. If the flywheel teeth are unknown you can manually start the generator by pressing and holding RUN. After the generator starts release the RUN button. Increase or decrease the flywheel teeth until the RPM matches the nominal RPM of the generator. To shut down the generator press OFF or ENT to accept. WARNING generator monitoring is not enabled during this test. You must verify that the generator is running at the correct RPM / Frequency for this to be accurate.

3. Enter the crank disconnect speed. This is the percentage of nominal that the starter will disengage. 30% is a good starting point if you are unsure. You can change this from the Engine > Cyclic Crank menu later if the starter disengages too early or too late.

4. Select the oil pressure sender. If your model is unknown you can change this from the Engine > Oil Pressure menu later.

5. Select the coolant temperature sender. If your model is unknown you can change this from the Engine > Temperature menu later.

6. Select the fuel level sender. Set to disabled if the fuel level sender is not used.

7. Set the nominal battery voltage. Typically 12 or 24 VDC.

8. Set the cyclic crank configuration. Some common options are provided. These can be later altered from the Engine > Cyclic Crank menu.

9. Select the stator configuration. Common configurations are provided. If you have a configuration that is not listed select the closest one. You can later adjust this in the System menu.

10. Set the nominal frequency. Typically 60Hz.

11. Set the cool down delay in seconds (300 seconds = 5 minutes). Set to 0 to disable.

12. Set the self exercise time in seconds. Set to 0 to disable. The exercise time will be set from the current time and set. To select a different exercise time, adjust from the Clock/Exer menu.

13. Set the nominal KW rating of the generator. Used for over current monitoring.

Press ENT to return to the MAIN MENU. Press OFF to exit the MAIN MENU and return to OFF. When prompted select YES to save settings.

RUNNING IN MANUAL

Press RUN to select manual run mode. To confirm, press and hold ENT to start the generator. If crank disconnects are configured properly, starter will disconnect. After the starter disconnects the generator will be running in manual mode. Press OFF to shut down the generator.

RUNNING IN AUTO

Press AUTO to put the controller in standby. By default, programmable input 1 is configured for remote start. Grounding programmable input 1 will start the auto start sequence. After crank disconnect, the controller will be running in auto. Remove ground from the remote start input to shut down. If cool down is enabled, the controller will run the cool down delay first. In both manual and auto run modes, you can press ENT with the right arrow highlighted to view each of the 5 display screens.

SELF EXERCISE

Self exercise must be enabled from the Clock/Exer menu and the controller must be in auto mode. When the day, hour, and minute match the self exercise setting, the self exercise cycle will run for the time defined in exercise duration (in seconds).

USER I/O

From the MAIN MENU select USER I/O.

User Inputs - Set the desired function and alarm option for each of the user inputs.
User Outputs - Programmable relays 1 and 2 can support up to 32 functions each.
Sender Slopes - The current slope will be loaded into the table. Press ENT to progress through each of the 10 resistance / value pairs to adjust the slope. The new slope will automatically be set to the corresponding input.
Factory Defaults - This option will overwrite all settings and return them to the factory defaults. It is recommended that you run the set up assistant and start the set up process again after loading factory defaults.

SETTING THE RUN HOURS

From the MAIN MENU select Clock/Exer. Press ENT to progress through the settings to Run Hours. Use the UP arrow to increase the run hours to match the total time on the generator. WARNING you can only increase run hours. Press OFF to cancel this selection.

CALIBRATION

It may be necessary to adjust the calibration settings to display correct values. Due to component tolerances, minor adjustments may be required.

From the MAIN MENU select Calibrate.

AC Voltage and Current
Voltage and current for phase A, B, and C. Run the generator and note the voltage/current displayed on page 3 of the main display. Measure the actual voltage/current and take the difference multiplied by 0.6 to get the calibration adjustment. For example, phase A = 115 VAC (displayed) and 120 VAC (measured). (120 - 115 = 5) 5 * 0.6 = 3 Increase the calibration factor by 3.

Battery Voltage
Battery voltage as displayed on the main screen. Increase the calibration factor to increase the voltage displayed.

Oil Pressure, Coolant Temperature and Fuel Level
To properly determine the resistance of the sender the controller must know the correct current. Disconnect the sender and measure the current in mA to ground. Adjust the current setting to match the measured current in mA.

Oil Pressure - 27.0 mA
Coolant Temp - 2.0 mA
Fuel Level - 27.0 mA

In addition to setting the correct current in mA, the correct table must be loaded for the sensor being used. Selecting one of the pre-programmed slopes will overwrite the user defined table. You can manually edit the table by selecting it from the USER I/O menu. There are 10 entries with a resistance/value pair. Press enter to step through the ten entries using the up and down arrows to alter the settings.

ADC Scaling Factor
The ADC scaling factor is set from factory to 180 or (0.180) and should not need adjustment. This setting is used to convert raw ADC values into measured voltage.

FIRMWARE UPDATES

Before completing a new installation it is best to check for any firmware updates. Note the firmware version on the main screen and go to www.flightsystems.com to check for the most recent firmware version. Details of the firmware update can be viewed in the included README file.

SENDER TABLES

Pre-programmed sender tables can be selected from the MAIN MENU > Engine > *sender input.* By selecting one of the pre-programmed sender slopes, the data in the user defined tables will be overwritten. To alter the lookup table for any of the three sender inputs, select MAIN MENU > USER I/O > *sender table*. Press ENT to step through the 10 entries, using the up and down arrows to increase or decrease the resistance / value pairs. By saving the altered table the corresponding input will be automatically saved as USER DEFINED.

EXAMPLE: Oil Pressure

From the OFF position, press ENT to enter the MAIN MENU. Select > Engine > Oil Pressure and press ENT to select a pre-programmed slope. Use the Up and Down arrows to select the ESP-100 sender. Press ENT to select and back or OFF button to escape to the OFF mode. Before entering the OFF mode, you will be prompted to save your settings. Select Yes and push ENT. The user defined oil pressure table will be loaded with the following entries.

Ohms	Value (PSI)
25	112
33	100
50	87
67	75
83	62
100	50
126	37
153	25
196	12
240	0

For this example lets correct the offset of the sender. With the generator off and the pressure at 0 psi, the actual sender resistance is 235 ohms.

To edit these entries select MAIN MENU > USER I/O > Oil Pressure Table 1. Press ENT to edit the table. Keep pressing ENT until the resistance for a value of 0 psi is selected (currently 240). Use the Down arrow to decrease this number to 235. When you are done editing the table press OFF to escape. When exiting the MAIN MENU you will be prompted to save your settings. Select Yes and press ENT.

After saving these settings to memory the selected oil pressure sender will automatically be set to USER DEFINED. You can confirm this by entering MAIN MENU > Engine > Oil Pressure and note that the selected sender now indicates USER DEFINED. Selecting a pre-programmed slope other than USER DEFINED will overwrite any changes made to the oil pressure table.

For most applications one of the pre-programmed slopes will work fine as is or at most need only a slight correction for offset. The controller will interpolate values between each of the ten enteries so it is important that the critical ranges be as precise as possible. Usually the ranges used for trip points and engine protection.

Oil Pressure 0 - 25 psi (pre low oil pressure and low oil pressure shutdown)
Coolant Temperature 180 - 230F (high coolant temperature)
Fuel Level 0 - 20% (low fuel)

After completing a new installation be sure to run the generator through a full cycle of remote start, remote stop, and cooldown, allowing enough time for the generator to reach maximum temperature to confirm the sender slopes are correct.

Oil Pressure

ESP-100

Ohms	PSI
25	112
33	100
50	87
67	75
83	62
100	50
126	37
153	25
196	12
240	0

VDO 360811

Ohms	PSI
0	150
25	113
50	83
75	68
100	52
125	37
150	26
175	17
200	10
250	0

VDO 360410B

Ohms	PSI
185	90
180	80
175	70
150	60
125	50
100	40
80	30
60	20
35	10
9	0

VDO 360025

Ohms	PSI
225	185
200	161
175	137
150	113
125	89
100	67
75	46
50	27
25	10
0	0

Coolant Temp

VDO 323-905

Ohms	Temperature
20	300
61	220
110	180
140	170
200	150
300	130
445	110
680	90
860	80
2700	30

DATCON 02019-00

Ohms	Temperature
30	234
60	186
100	155
150	140
200	124
300	107
400	92
600	75
800	65
2750	32

STEW-WARN 334P

Ohms	Temperature
30	300
60	242
100	205
150	180
200	160
300	138
400	122
600	104
800	89
2750	32

FARIA TS4042

Ohms	Temperature
30	322
60	208
100	175
150	154
200	143
300	126
400	109
600	96
800	90
2750	32

ISSPRO R8959

Ohms	Temperature
30	292
60	246
100	214
150	187
200	176
300	156
400	142
600	126
800	114
2750	65

EST-250-300

Ohms	Temperature
26	300
63	240
100	210
176	180
200	176
300	156
410	140
600	126
800	114
2750	65

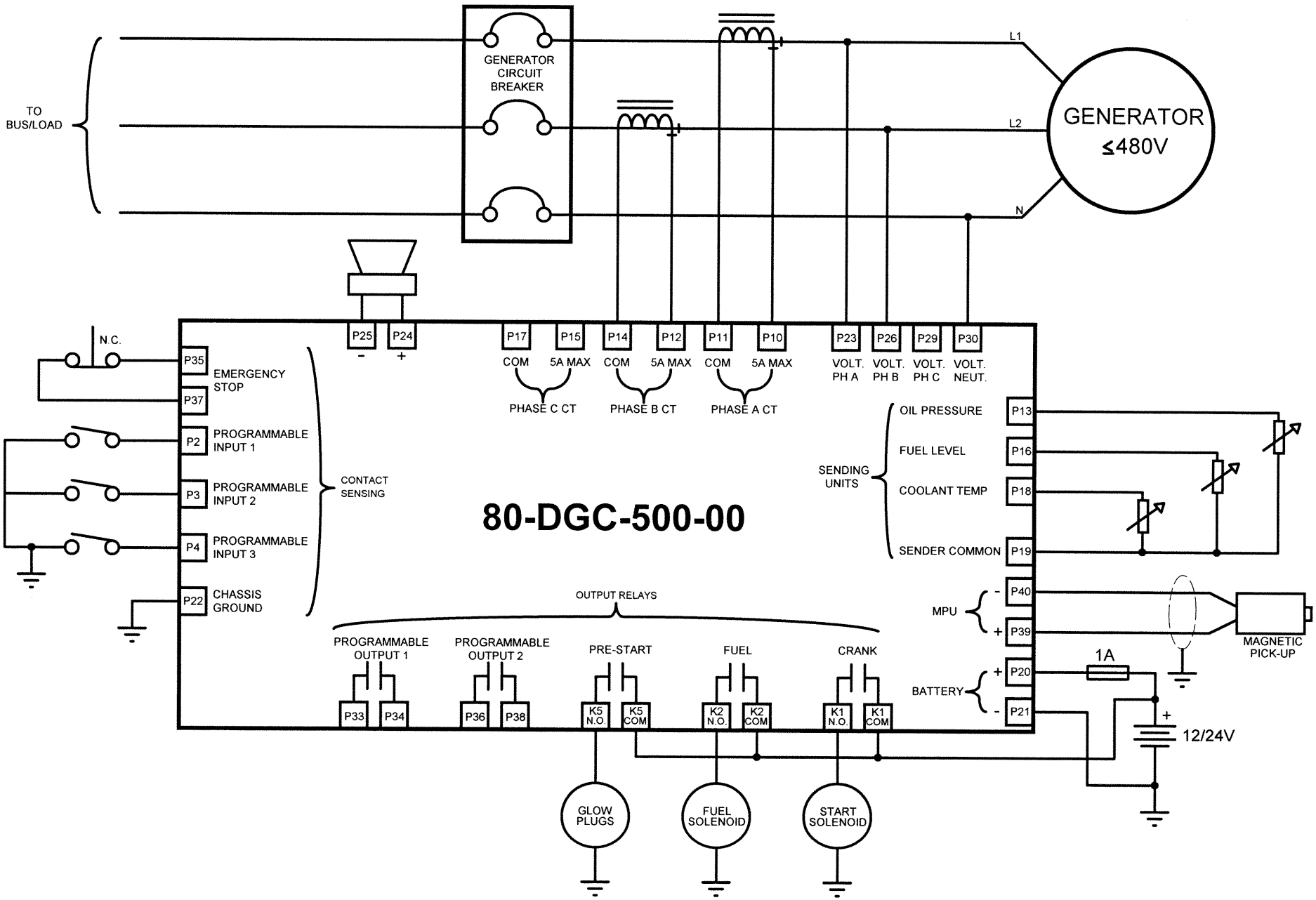
EG21T-300

Ohms	Temperature
26	300
63	240
100	210
176	180
200	176
300	156
410	140
600	126
800	114
2750	65

Fuel Senders

ISSPRO R8925

Ohms	Percentage
33	99
58	87
84	75
110	62
136	50
162	38
188	26
214	13
240	1
250	0



80-DGC-500-00 SINGLE-PHASE CONNECTIONS