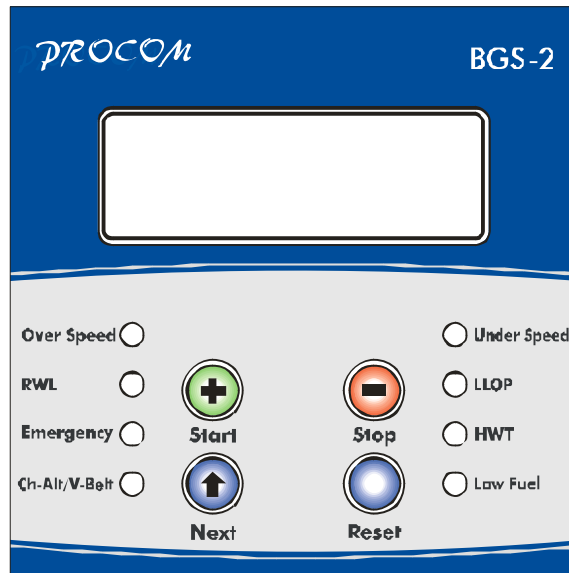




OPERATING INSTRUCTIONS BGS-2



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BGS-2 Basic Generator Supervisor

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1.0 Introduction

- 16 Bit RISC, state of art, microcontroller based System.
- True RMS measurement of all measured parameters with 1% accuracy of measured value (Not full scale)
- Backlit LCD Display for easy reading and parameter settings. No need to consult the manual while programming the unit.
- All the inputs, such as Generator and Battery voltages are fully isolated, providing the freedom to design a totally isolated system. This avoids and prevents malfunctioning/ burning of the unit.
- Can withstand a voltage dip up to 0V for 0.5sec.
- All system parameters are user programmable
- Measurement and display of LLOP, Fuel Level and HWT
- All digital inputs are optically isolated for enhanced reliability
- All outputs are through potential free contacts for system stability and reliability
- Load Dump Protected
- Housed in 92X92mm Din Standard housing.

2.0 Protection, Supervision Salient features

- Oil Pressure
- HWT
- RWL
- Emergency
- Low Fuel
- Charging Alternator Fail/V-Belt
- Run Hour (Optional). The charging alternator and LLOP Sensor should be connected to the system for this to work
- DG Over/Under Frequency

3.0 Measurement & Display

BGS-2 equipped with LCD display and displays

- Generator Frequency
- Battery Voltage
- RPM
- Oil Pressure in KG/cm²
- Radiator Temp in degree centigrade
- Fuel Level in %
- Programmed settings
- Run Hour (Optional)

Normally the display auto scrolls and displays a set of parameter for 10 seconds, but any time the Next key (↑) can be pressed to select the next parameter window.

4.0 Annunciations

In front through LED

BGS-2 is equipped with the following annunciations for system status and faults:

- LLOP
- HWT
- Fuel
- RWL
- DG Over frequency
- DG Under Frequency
- Charging Alternator/ V-Belt
- Emergency

Through Potential Free contacts

6 Potential free contacts are provided in the unit. Each of these contacts can be assigned to one or multiple of the following conditions.

- a) DG Running
- b) DG Not Running

- c) Low fuel fault
- d) HWT/HCT Fault
- e) RWL
- f) LLOP Fault
- g) Fuel lesser than 15%
- h) Fuel Lesser than 40%
- i) Fuel greater than 90%
- j) Charging Alternator Fault
- k) Under frequency fault
- l) Over Frequency Fault
- m) LLOP Sensor Open
- n) Temperature Sensor Open
- o) Fuel Sensor Open

5.0 Contacts

The following digital Output are provided. Annunciation contacts are available in models requested with Annunciation features.

- Crank (NO Contact)
- Solenoid (NO Contact)
- Electrical Feed for Charger (NO Contact)
- ^ Annunciation Contacts (NO Contact)

6.0 Timers

BGS-2 is equipped with the following timers:

- Generator over speed supervision timer
- Stop Solenoid on time
- Fuel supervision time
- LLOP supervision time
- HWT supervision time
- RWL supervision time
- Ch. Alt Supervision Time
- Ch Alt Relay On Time
- Max Crank Time

7.0 Switches Description

BGS-2 has 4 switched are provided on its front panel. Switch can have more than one functions assigned to them. The table below describes the operation of these.

S.No.	Switch Symbol	Switch Function	Description
1	↑	Next	Normal operation mode: In this mode, it is used to change the parameters being displayed on LCD. Programming Mode: Next key is used to select the next parameter to be programmed.
2	+	Increment	Programming Mode: It is used to increment the value of the parameters under programming. Normal operation mode: It is used to Start the Engine
3	-	Decrement	Programming Mode: It is used to decrement the value of the parameter under programming. Normal operation mode: It is used to Stop the Engine
4	R	Reset	Reset key resets Fault signals.
5	R & ↑	Programming Mode Entry	Press “R” Key and than press “↑” while the “R” Key is pressed to enter the programming mode.

8.0 Operation.

BGS-2 is an engine monitoring and supervisor unit. The engine can be Started/Stopped from the front panel of BGS-2 or externally by means of key Switch etc. BGS-2 automatically detects that the engine on conditions by monitoring the generator voltage and starts monitoring the engine for frequency, LLOP, HWT, Low Fuel, RWL and emergency faults. On detection of any of these faults for the pre-programmed duration the engine is automatically shut down.

9.0 Setting Procedure

BGS-2 has provision to program the operating parameters and annunciations separately. Programming Mode can be entered any time by simultaneously pressing **+** & **-** switches. As soon as BGS-2 enters the programming mode the Display Screen shall display "Select Pra/Ann +" in first Row and "Parameter Mode" in second row, "Pressing **↑**" Switch will take the units in parameter programming mode. To program the annunciation contacts scroll the screen by pressing **+**. The display shall now display "Annunciator Mode". Press **↑** Switch to enter annunciation contacts programming mode. While in Program Mode, the first row of LCD displays parameter/annunciation contact name/number under programming and second row contains the parameter value. *Please note that 20sec of inactivity will take the unit back in normal mode and all the changes done shall be cancelled.* The following tables gives the detailed descriptions.

9.1 Parameter Mode

Sl. No	Display	Explanation of parameter	Factory setting	Setting Range
1	Generator O/F*	Over frequency setting	65 Hz	40 – 80 Hz
2	Gen O/F Delay	Monitoring time for Over frequency	5 Sec	1-999Sec
3	Generator U/F*	Under frequency setting	45 Hz	40 – 80 Hz
4	Gen U/F Delay	Monitoring time for Under frequency	10 Sec	1-999Sec
5	Fuel Level in % *	Level of fuel at which the Engine shall shut down	20%Sec	10-100%
6	Fuel << delay	Monitoring time of Fuel Fault	5 Sec	1-999Sec
7	Low Lube Pressure	Level of LLOP at which the Engine shall shut down	2.0 Kg /Cm2	0-8.5 Kg /Cm2
8	LLOP delay	Monitoring time of LLOP Fault	5 Sec	1-999 Sec
9	High Water Temp	Temperature of water at which the Engine shall shut down	80	0-150 Degree centigrade
10	HWT delay	Monitoring time of HWT Fault	5 Sec	1-999 Sec
11	Rad. Water Delay	Time for which Radiator water level has to be active before issuing shut down command	5 Sec	1-999 Sec
12	Charging Delay*	Time delay after which the charging alternator/V-Belt fault shall be activated.	5 Sec	1-999Sec
13	Stop Sol On Time	Time for which the fuel solenoid is activated for shutting the engine	20Sec	1-100Sec
14	Emer Sol Time	This setting is to protect the fuel solenoid in case the Stop button or Emergency is kept pressed. In such a case the solenoid shall be released after this time.	22Sec	1-100Sec

15	Max. Crank Time	Max. time for which the crank through remote start is allowed. This time is meant to protect the crank motor in case of failure of external AMF and alternator voltage build up. After this time the Emergency LED starts blinking and the crank is disabled	8Sec	1-25Sec
16	Chg Alt Relay Tim	Time for which the magnetizing relay of charging alternator will be switched on after the engine has started.	5Sec	5-100Sec
17	Disp Auto Scroll	Setting ON will enable Auto Scroll of display. OFF: No scroll and next parameter can be viewed by pressing next	ON	ON/OFF

** This parameter can be disabled while programming*

9.2 Annunciation Mode

S.No	Parameter name on first row of LCD	Setting	Factory Setting and remark
1	DG Running	0-ANN1-ANN6	1
2	DG Not Running	0-ANN1-ANN6	0
3	Fuel Fault	0-ANN1-ANN6	2
4	HWT Fault	0-ANN1-ANN6	3
5	RWL Fault	0-ANN1-ANN6	0
6	LLOP Fault	0-ANN1-ANN6	4
7	Fuel <15%	0-ANN1-ANN6	0
8	Fuel <=40%	0-ANN1-ANN6	0
9	Fuel >90%	0-ANN1-ANN6	0
10	Chg Alt Fault	0-ANN1-ANN6	5
11	Under Freq Fault	0-ANN1-ANN6	0
12	Over Freq Fault	0-ANN1-ANN6	0
13	LLOP Sensor OPEN	0-ANN1-ANN6	6
14	Temp Sensor OPEN	0-ANN1-ANN6	6
15	Fuel Sensor OPEN	0-ANN1-ANN6	6

10.0 Faults

There are two categories of faults

- Internal Faults
- External faults

10.1 Internal Faults

Internal faults are the faults, which do not need any external signals and are detected by the system itself. They are:

- Generator Over & under frequency.
- LLOP
- Fuel
- HWT

10.2 External Faults

Those faults which cannot be sensed by the unit itself (these faults are not reflected by the generator voltage) and are to be provided externally. They are:

- RWL

10.3 Fault Reset

All internal faults can be reset by pressing (R) switch after the generator is stopped. In case the engine fails to stop “STOP KEY” can be pressed for manual attempt to stop engine.

11.0 Terminal description

Terminal Number	Description
1	Generator R Phase Voltage
2	Generator neutral
3	LLOP Sensor
4	HWT Sensor
5	Fuel Sensor
6	Remote Start
7	Remote Stop
8	RWL
9	Charging Alternator Input
10-11	Charging Alternator On(Contact)
12	Common for Annunciation 1-3
13	Annunciation3
14	Annunciation2
15	Annunciation1
16	Common For Crank & Sol
17	Crank NO Contact
18	Solenoid NO Contact
19	Auxiliary supply +ve
20	Auxiliary supply -ve
21	Annunciation4
22	Annunciation5
23	Annunciation6
24	Common for Annunciation 4-6

12.0 Specifications

AC voltage withstand	330 VAC (Phase to neutral)
Measurement Accuracy	
Voltage	1%
Surge 1.2/50Usec	2.5KV
Battery Voltage	Suitable for 12V System
Min. voltage to power on	9V
Max. Battery Voltage	15V
DC Interruption time	0.5Sec.
Cut out Dimensions	92mm X 92mm
Depth	120mm
Digital Input Level	Battery Voltage (Negative) except Charging Alt, which is battery supply

It is our endeavour to constantly upgrade our products, hence specifications are subject to change without any notice.