![C&S electric logo]

EGC-150
Engine Control Relay

EGC
EGC
EGC

EGC

Series

EGC-150

HCT/HWT
LLOP
E-STOP
LOW FUEL
OVER LOAD

RESET ENTER
START
STOP

ENGINE RUN

Catalogue

INDEX

1 Introduction

EGC-150 is a MANUAL/REMOTE Generator controller cum supervisory module designed to control the engine via push buttons on front panel or remotely operated key switch/digital inputs. During all cycles, generator is fully monitored and protected against any fault. All the alarm occurring at abnormal GEN-SET conditions are detected and displayed on LCD display and if necessary GEN-SET is stopped and hooter gets activated.

2 Features

- Display of 3 Phase Generator Parameters: Voltage, Load Current, Power factor.
- Display of Other DG Parameters: Frequency, Speed, Run Hours.
- Measurement and Display of Active Power(kW) and Total Active Energy (kWh).
- Measurement and Display of Fuel Level, Water Temperature, Oil Pressure through Resistive Gauge interface.
- Programmable Parameters including Under/Over Voltage (UV/OV), Under/Over Frequency (UF/OF) and other delay times.
- 7 LEDs, 5 Digital Inputs and 3 Potential outputs for driving of relays on external relay card.
- Fault records for ease of analysis.
- Full engine safety functions: Low Fuel, High Coolant Temperature (HCT), Low Lubricant Oil Pressure (LLOP) and DG Over Load etc.
- DG Supervision on Radiator Water level (RWL), Charge alternator (CHG_ALT), Canopy Temperature (C_TEMP)
- Manual & Remote Operation mode with Emergency Stop option.
- User Programmable option for sensor selection, phase selection and solenoid type selection.

3 Application

- Manual DG set control.
- DG Supervision & protection.
- AMF Panel.

4 Hardware

- 3 Analog inputs for DG current & voltage
- 3 Analog/Digital inputs for resistive gauge interface
- 5 Digital inputs for DG
- 3 Potential outputs for operating external relays.
- 7 LEDs for Annunciation.
- 5 Editing and Control keys.
- Charge Alternator Input-Output.

5 Protection Features

- Over/ Under Voltage and Frequency Indication / Shutdown.
- DG faults like Fail to Start, Fail to Stop, Over Speed.
- Protection against DG Overload with selectable overload setting.
- Protection against engine faults like FUEL, HCT, LLOP stored via inputs.
- Emergency Stop.

6 Operating Modes

EGC-150 operates in one of the two modes as described below. The operating mode must be selected from MMI.

These modes are Manual Mode & Remote Mode.

6.1 Manual Mode

This mode is selected through parameter menu. In this mode EGC-150 will be operated manually. It will only respond to START and STOP keys for Generator start and stop operation. These keys will be functional only when manual mode is active. Before giving start command to Generator one must ensure that Generator CB is open. Start key should be pressed until the engine reaches the threshold speed. Generator CB may now be closed provided that the Mains CB is open. Pressing of Stop key turns off the engine. Before giving stop command from keypad, the generator CB must be open. The generator is stopped without going through recooling phase. In this mode all protection for Gen Set like under voltage, over voltage, under/over frequency, HCT, LLOP etc. will remain active.

6.2 Remote Mode

This mode is selected through parameter menu. In this mode EGC-150 will be operated remotely. It will only respond to Remote Start DI signal and Remote Stop DI signal for DG start and stop operation. Before giving start command to Generator one must ensure that Generator CB is open. Remote Start DI signal should be held down until the engine reaches the threshold speed. Generator CB may now be closed provided that the Mains CB is open. Remote Stop DI signal turns off the engine. Before giving stop command from DI, the generator CB must be open. The generator is stopped without going thru re-cooling phase. In this mode all protection for GEN-SET like under voltage, over voltage, HCT, LLOP etc. will remain active.

> Note : Remote mode can be used as an Auto mode also. By using the following connection details:
> 1) Connect R_START DI in such a way, so that when Mains goes off, This DI should be closed.
> 2) Connect R_STOP DI in such a way, so that this DI should be closed, when Mains present.

> **Note : User must ensure interlocking of Mains and Generator CB during Manual and Remote Mode of EGC-150.**

7 Fault Recording

EGC-150 records faults in its non volatile memory.
Fault indicator helps the user to identify clearly the fault and to monitor relay setting and operation.
Latest fault will be the 1st one.

8 Human Machine Interface

It comprises 12 character x 2 Line Bright alpha numeric display, 7 LEDs for indication, 5 Push buttons for edit, view or other operations and local access.

- Two push switches for scroll, view or to set values of different parameters.
- One switch for reset or enter values.
- Two switches for Start & Stop the DG manually.
- 7 LEDs for fault or event annunciation. See figure below.

Keys	Description
▲	Scrolling up/Increment key
▼	Scrolling down/Decrement key
START	DG START key [manual mode only]
STOP	DG STOP key [manual mode only]
RESET ENTER	ENTER key & Fault RESET key (Long Press for 2 Sec.)

Output Contacts

No. of Digital outputs	:	3 (Three)
Type of outputs	:	Potential

Input Contacts

No. of Digital inputs	:	5 (Five)
No. of Analog inputs	:	3 (Three)
Programmable Analog Input	:	Yes

Charge Alternator Input-Output :   **Yes**

9 DG Parameter Settings

S. No.	Parameter	Display	Min	Max	Step Size	Unit	Exit	Default Setting
01	Operation Mode	Mode	MAN	REM	----	----	NO	MAN
02	DG Type Selection	GenType	1 Phase	3 Phase	----	NONE	----	3 Phase
03	Fuel Solenoid Type	SolnType	OFF	ON	----	NONE	----	ON
04	Under Voltage	UndrVol	20	200	1	V	YES	190
05	Under Voltage Delay	UVolDly	1	999	1	SEC	NO	10
06	Over Voltage	OvrVolt	50	300	1	V	YES	260
07	Over Voltage Delay	OVolDly	1	999	1	SEC	NO	10
08	Under Frequency	UnFrq	30	99.9	0.1	Hz	YES	47
09	Under Frequency Delay	UFrqDly	1	999	1	SEC	NO	10
10	Over Frequency	OvFrq	40	99.9	0.1	Hz	YES	53
11	Over Frequency Delay	OFrqDly	1	999	1	SEC	NO	10
12	Frequency Block Voltage	FrqBlkV	50	200	1	V	NO	100
13	Ignition Voltage	IgnVol	50	250	1	V	NO	65
14	Generator Remote Start Delay	GenStrtDly	1	9999	1	SEC	NO	10
15	Generator Remote Stop Delay	GenStopDly	1	999	1	SEC	NO	10
16	No. of Generator Crank	NoOfGenCrank	1	9	1	----	NO	3
17	Generator Crank Period	Crankperiod	1	40	1	SEC	NO	10
18	Crank Wait Time	CrankWaitTm	1	999	1	SEC	NO	10
19	Supervision Time	SuprDly	1	999	1	SEC	NO	15
20	Stopper Time	StprDly	1	999	1	SEC	NO	20
21	Battery Low Indication	BatLow	6	35.0	0.1	V	YES	10
22	Battery High Indication	BatHgh	6	35.0	0.1	V	YES	16
23	Over Speed	OvSpd	1200	9999	1	RPM	YES	1650
24	Over Speed Delay	OSpdDly	1	999	1	SEC	NO	10
25	Alternator Protection	AltFChk	DISABLE	ENABLE	----	NONE	----	ENABLE
26	Alternator Fault Delay	AltFltDly	3	600	1	SEC	NO	25
27	Radiator Water Level Delay	RWLDly	1	999	1	SEC	NO	5
28	Canopy Temperature Delay	CTmpDly	1	999	1	SEC	NO	5
29	Charge Alternator Delay	ChgADly	1	999	1	SEC	YES	5
30	Charge Alternator On Time	ChAOnTm	1	200	1	SEC	NO	5
31	Hooter On Time	HtrOnTm	1	999	1	SEC	NO	10
32	Over Load	OvrLoad	10	200	5	%In	YES	120
33	Over Load Trip Time	OvLdDly	1	60	1	SEC	NO	10
34	CT Ratio	CTRatio	1	999	1	NONE	NO	20

10 Sensor Parameter Settings

S. No.	Parameter	Display	Min	Max	Step Size	Unit	Exit	Default Setting
1	Fuel Level Check*	FSnsr	DISABLE	User Defined	-	NONE	----	DISABLE
2	Low Fuel Level	LoFlLvl	1	100	1	%	YES	20
3	Low Fuel Level Delay	LoFlDly	1	999	1	SEC	NO	5
4	High Temperature Check*	TSnsr	DISABLE	User Defined	----	NONE	----	DISABLE
5	High Temperature	HiTmp	10	120	1	^{0}C	YES	90
6	High Temp. Supervision Delay	HTmpDly	1	999	1	SEC	NO	5
7	Low Oil Pressure Check*	PSnsr	DISABLE	User Defined	---	NONE	----	DISABLE
8	Oil Pressure check at start	P-Start	DISABLE	ENABLE	----	NONE	----	DISABLE
9	Low Oil Pressure Level	LPsr	1	10	----	Bar	YES	2
10	Low Oil Pressure Delay	LPsrDly	1	999	1	SEC	NO	5

* Can be used as Digital Input also.

11 Analog Sensor Selection

Fuel Level Sensor		Coolant Temperature Sensor		Engine Oil Pressure Sensor	
#	Sensor Type	#	Sensor Type	#	Sensor Type
0	Disable	0	Disable	0	Disable
1	Digital	1	Digital	1	Digital
2	VDO Ohm (10-180) **	2	VDO 120 deg C**	2	VDO 5 Bar**
3	VDO Tube Type	3	Datcon High**	3	VDO 10 Bar**
4	US Ohm	4	Datcon Low**	4	Datcon 5 Bar
5	GM Ohm (0-90)**	5	Murphy**	5	Datcon 10Bar
6	GM Ohm (0-30)**	6	Cummins**	6	Datcon 7 Bar
7	Ford	7	PT-100	7	Murphy 7 Bar
8	Set-F1**	8	Veglia**	8	CMB812**
9	User Defined**	9	Beru**	9	Veglia
		10	VECF**	10	VECF**
		11	Set-T1**	11	Set-P1**
		12	User Defined**	12	User Defined**

12 Technical Data

** These sensors can respond to both Digital and Analog type input signal simultaneously.

12.1 Performance Specifications

S.No	Parameter	Specification
1	Aux. supply	7–35V DC
2	Aux. supply Interruption Time	Half second sustains battery dip down to zero
3	Aux. supply burden	<1.0W @24V DC
4	Generator voltage	P-N: 300V AC, P-P: 600V AC [Max]
5	Rated frequency	50 / 60 Hz
6	Rated secondary current	5A
7	Secondary current measurement	0.1 - 7A
8	Charge alternator positive output*	210mA @12V DC / 105mA @24V DC (2.5W)

* This is a combined Input & output Terminal. Do not ground and left unconnected, if not in use.

12.2 Measurement Accuracy

S.No	Parameter	Accuracy
1	Gen. Voltage	± 1%
2	Frequency	± 1%
3	Battery Voltage (VBatt)	± 2%
4	Load Current	± 2%
5	Active Energy	± 2% at PF=1

13 Connection Diagram
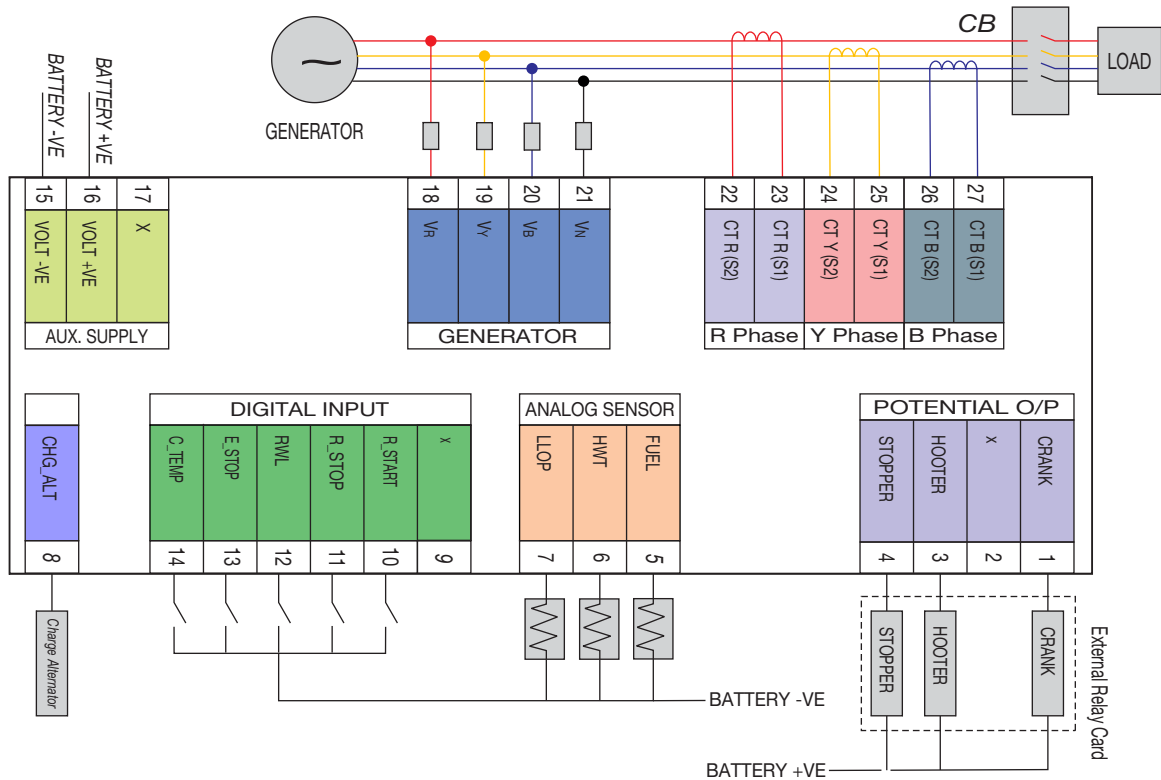
14 Terminal Description

Terminal No.	Connection Name	Connection Description	Connection Type
1	CRANK	Crank	Potential Output
2	x	Not Connected	
3	HOOTER	Hooter	
4	STOPPER**	Stopper	
5	FUEL	Low Fuel Level	Analog Sensor Input*
6	HWT	High Water Temperature	
7	LLOP	Low Lubricant Oil Pressure	
8	CHG_ALT	Charge Alternator	Combined Input/Output
9	x	Not connected	Digital Input
10	R_START	Remote Start	
11	R_STOP	Remote Stop	
12	RWL	Radiator Water Level Low	
13	E-STOP	Emergency Stop	
14	C_TEMP	Canopy Temperature High	
15	Volt -ve	Battery Voltage -	Auxiliary Power Supply
16	Volt +ve	Battery Voltage +	
17	x	Not Connected	
18	V_R	R Phase Voltage	Generator Voltage Input
19	V_Y	Y Phase Voltage	
20	V_B	B Phase Voltage	
21	V_N	Neutral Voltage	
22	CT_R (S2)	R Phase Load (Out)	Secondary Current (For load on generator)
23	CT_R (S1)	R Phase Load (In)	
24	CT_Y (S2)	Y Phase Load (Out)	
25	CT_Y (S1)	Y Phase Load (In)	
26	CT_B (S2)	B Phase Load (Out)	
27	CT_B (S1)	B Phase Load (In)	

* can be used as digital input also   ** can be used as fuel solenoid also
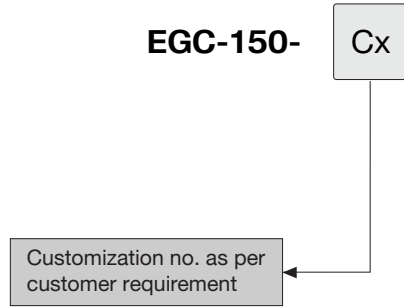
15 Dimensional Details

EGC-I50

HCT/HWT

LLOP

E-STOP

LOW FUEL

OVER LOAD

START

RESET ENTER

STOP

ENGINE RUN

96.00mm

96.00mm

89.00mm

55.00mm
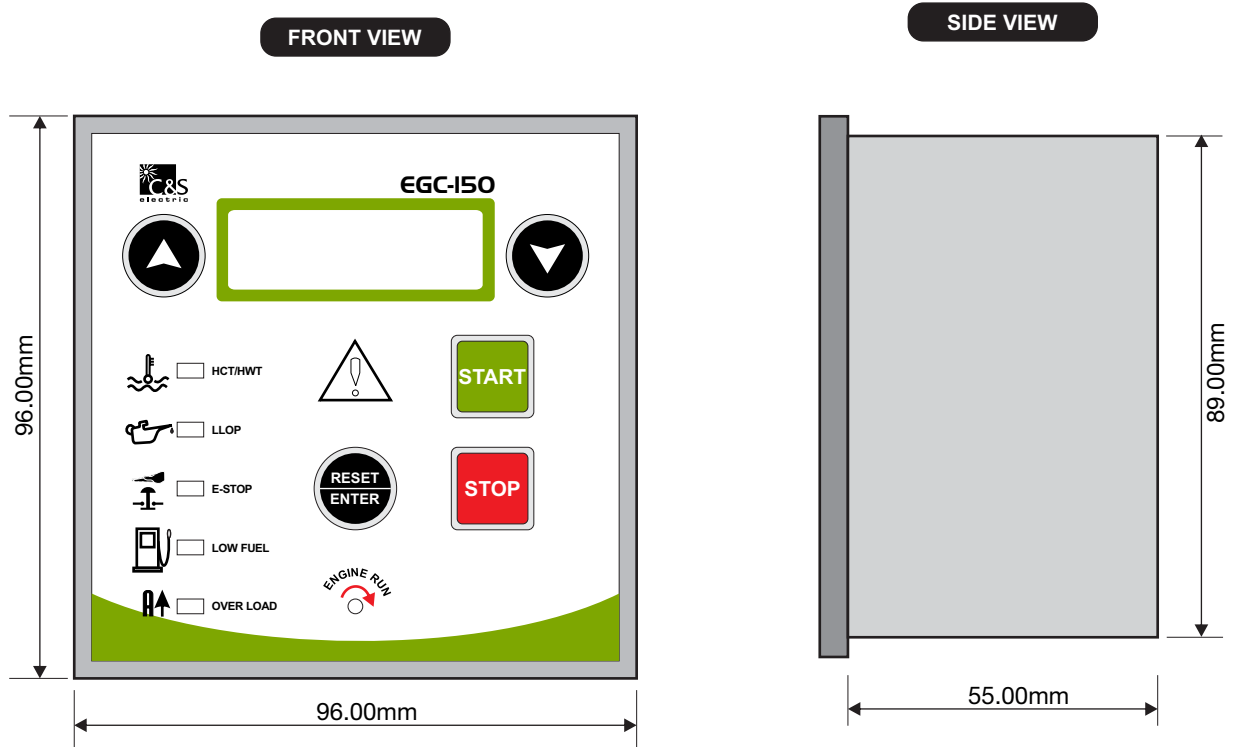
16 Panel cut out Details

90.00mm +/- 0.5

90.00mm +/- 0.5
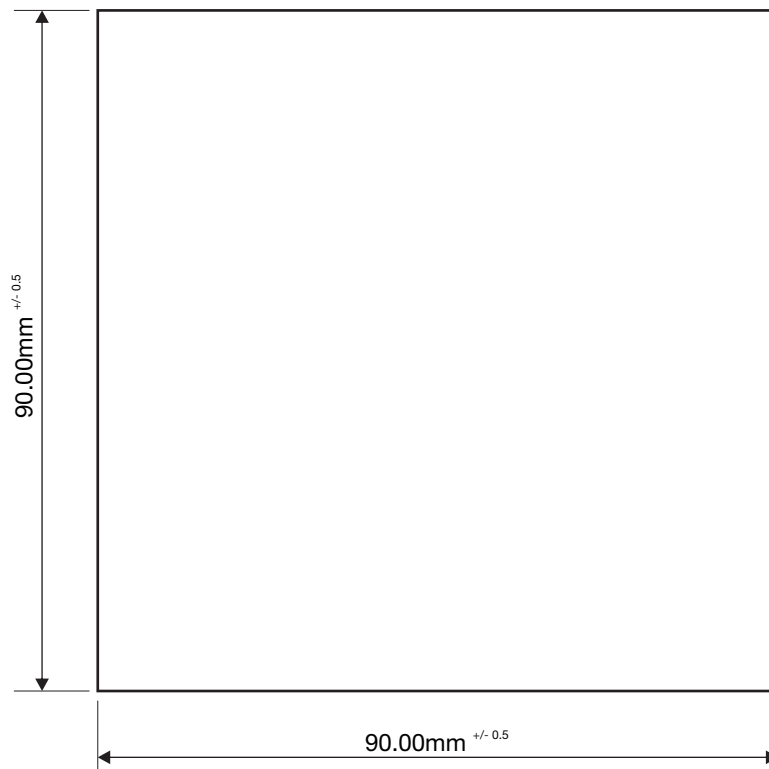
17 Ordering Information


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EGC-150-  [ Cx ]
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Customization no. as per customer requirement

Revision History

S.No.	Rev.No.	Details	Date

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