C&S electric

EGC-250

Engine Control Relay

EGC

EGC

EGC

EGC Series

Catalogue

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Introduction

EGC-250 is a MANUAL Generator controller module including protection for standby power supply (Generator/ DG Set). It uses single advanced micro controller chip for an easy and trouble free DG control. It is cost effective solution for DG operation. User can start the DG manually or automatically using remote mode operation. User can control DG or Mains breaker using front keys or DI. In any faulty condition it raise alarm. All the alarm occurring at abnormal DG conditions are detected and displayed on LCD and if necessary DG is stopped and hooter gets activated.

Features

- Display of 3 Phase Generator Parameters: Voltage, Frequency, Speed, Run Hours
- Measurement and display of Load current and Instantaneous load in kW
- Metering Energy for DG.
- Wide range of Programmable Parameters including settings of voltage, frequency, different delay times
- Wide range of Analog Sensor Selection
- All DI/DOs are programable
- Fixed combined input-output charge alternator port with short circuit protection
- Fault records with date and time stamp
- Event records with date and time stamp
- Logical interlock for Mains & DG breaker for fail safe operation
- Wide array of time circuits for start delay, stop delay, re- cooling etc
- Full engine safety functions: The unit has Low Lube Oil Pressure (LLOP), Hi Coolant Temperature (HCT), Over speed, Start Failure, Stop Failure, Fuel level trip, Emergency stop and Overload trip functions

Hardware

- 3 Analog inputs
- 5 Digital inputs
- 6 Potential outputs for operating external relays
- Charge Alternator Input / Output
- MODBUS/GSM/USB communication (optional)

DG Protection

- Under/Over Voltage & Frequency protection
- Overload protection with selectable Over load setting
- Internal interlock for EB (Mains) & DG CB (Circuit Breaker) for Fail Safe Operation
- Manual circuit breaker options
- Wide array of time circuits for Start delay, Stop delay, Re- cooling, Cranks etc
- DG Faults like Fail to start, Fail to stop & Low battery
- Protection against Engine faults like LLOP, HCT, Low Fuel & Over speed etc
- Programmable Timers
- All DI/DOs are programmable
- Wide range of analog sensor selection
- Fuel Engine Safety Functions
- Maximum Fail Safe Protections like RWL, Charge Alternator, Canopy Temperature, Air Cleaner Blockage & Emergency Stop

Operating Modes

EGC-250 operates in one of the three modes as described below. The operating mode can be selected from parameters settings.

The Three modes are:

(a) Manual Mode

(b) Remote Mode

(c) Installation Mode

Manual Mode

This mode is selectable from parameter settings. In this mode EGC-250 will be operated manually. It will only respond to START and STOP keys or manual START, STOP DI for Generator start and stop operation. These keys will be functional only when manual mode is active. Generator and Mains CBs will not be operated automatically. User can open or close CBs using from breaker keys. 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 thru recooling phase. In this mode all protection for Gen Set like under voltage, over voltage, HCT, LLOP etc. will remain active.

Remote Mode

This mode can be selected from parameter setting. It will only respond to Remote Start DI signal and Remote Stop DI signal for DG start and stop operation. Generator and Mains CBs will be operated externally through DI without automatic control of EGC-250. 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 recooling phase. In this mode all protection for GEN-SET like under voltage, over voltage, HCT, LLOP etc. will remain active.

Installation Mode

This mode is selectable from parameter settings. This mode is to check connections only at time of installation or servicing.
User can see the current status of DI-DOs. User can also operate or DOs or can toggle the state of each DOs irrespective of any conditions or internal interlocking of MCB and GCB. User need to be very careful and must be aware of the operation of the controller and connections, to avoid mis happening. In this mode all protections are off, control switches are inactive. But in this mode metering works as any other operating mode. Parameter will not be save for DI, DO settings etc.

Note : User must ensure interlocking of Mains and Generator CB during Installation Mode of EGC-250.

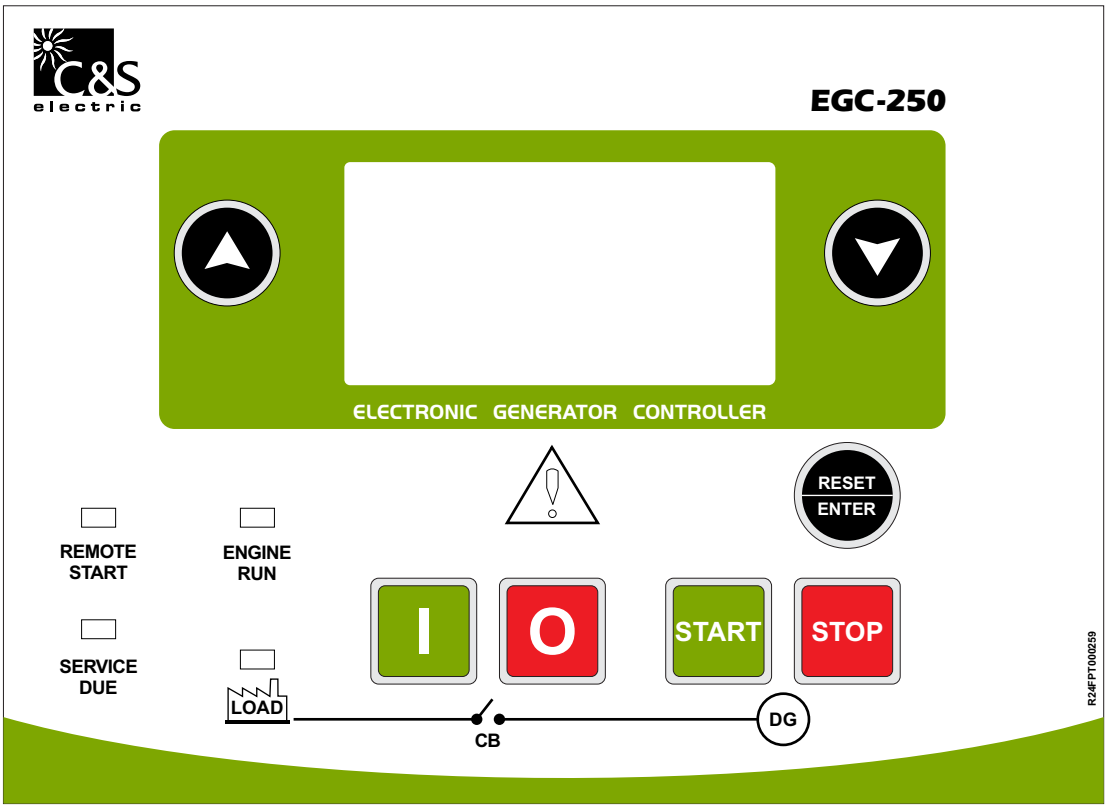
Fault & Event Recording

EGC-250 records faults & events in its non volatile memory with date and time stamp.
Fault indicator helps the user to identify clearly the fault and to monitor relay setting and operation.
Latest fault/event will be the 1st one.

Human Machine Interface

For fault annunciation, setting parameters and other DG operations & local access It comprises of:

- Three switches for editing and viewing of parameters.
- Two switches for breaker control. MCB and GCB both can be operated depending on the availability of DG voltage
- Two switches for DG Start & Stop.
- 5 LED's are for Supply status, DG status and Fault or Warning annunciation see figure given below:



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

Output Contacts

No. of Potential outputs : 6 (Six)
Type of outputs : Potential

Input Contacts

No. of Digital inputs : 5 (Five)
No. of Analog inputs : 3 (Three)
Programmable (DI / DO) : Yes
Advanced Charge Alternator Contact : Yes

Setting Ranges

S. No.	Parameter	Display	Min	Max	Step Size	Unit	Exit	Default Setting
	DG PARAMETERS							
1	Power-up Mode	PwrupMod	MANUAL	INSTAL	NONE	NONE	----	INSTAL
2	Phase Select	PhaseSelect	1Ph	3Ph	----	NONE	----	3Ph
3	Under Voltage	UndrVoltag	20	200	1	V	YES	190
4	Under Voltage delay	UndrVolDly	1	999	1	SEC	NO	10
5	Over Voltage	OverVoltag	50	300	1	V	YES	260
6	Over Voltage delay	OverVolDly	1	999	1	SEC	NO	10
7	Under Frequency	UndrFreq	30	99.9	0.1	Hz	YES	47
8	Under Frequency Delay	UndrFrqDly	1	999	1	SEC	NO	10
9	Over Frequency	OverFreq	40	99.9	0.1	Hz	YES	53
10	Over Frequency Delay	OverFrqDly	1	999	1	SEC	NO	10
11	Under Speed	UndrSpd	400	9999	1	RPM	YES	1350
12	Under Speed Delay	UndrSpdDly	1	999	1	SEC	NO	10
13	Over Speed	OverSpd	400	9999	1	RPM	YES	1650
14	Over Speed Delay	OverSpdDly	1	999	1	SEC	NO	10
15	Frequency Block Voltage	FrqBlckVol	50	200	1	V	NO	100
16	Ignition Voltage	IgnitnVolt	50	250	1	V	NO	65
17	No. of DG Cranks	NoOfDgCranks	1	9	1	NONE	NO	3
18	Crank Period	CrnkPeriod	1	999	1	SEC	NO	5
19	Crank Wait Time	CrnkWaitTm	1	999	1	SEC	NO	10
20	DG Start Delay	DgStrtDly	1	9999	1	SEC	NO	10
21	DG Stop Delay	DgStopDly	1	999	1	SEC	NO	10
22	Supervision Delay	SuprvsnDly	1	999	1	SEC	NO	15
23	Stopper Delay	StopperDly	1	999	1	SEC	NO	20
24	Circuit Breaker Delay	CktBrkrDly	1	999	1	SEC	NO	5
25	DG Recool Time	DgRecoolTm	1	999	1	SEC	NO	30
26	Alternator Fault Check	AltrFltChk	DISABLE	ENABLE	----	NONE	----	ENABLE
27	Alternator Fault Delay	AltrFltDly	3	600	1	SEC	NO	25
28	Charge Alternator on Time	ChgAltOnTm	1	200	1	SEC	NO	10
29	Chg-Alt Supervision Time	ChgSuprvsn	1	999	1	SEC	YES	10

Setting Ranges

S. No.	Parameter	Display	Min	Max	Step Size	Unit	Exit	Default Setting
	OTHER PARAMETERS							
1	DG Start	DGStrt	DGVoltag	Vol+LLOP	----	----	----	DGVoltag
2	CT Ratio	CT Ratio	1	999	1	NONE	NO	20
3	Over Load Cutting	OvrLoadCut	10% In	200% In	5%	%	YES	120
4	Over Load Delay	OvrLoadDly	1	999	1	SEC	NO	10
5	Hooter On Time	HooterOnTm	1	999	1	SEC	NO	10
6	Battery Low Voltage	BatLoVolt	6.0	35.0	0.1	VOLT	YES	10.0
7	Battery Hi Voltage	BatHiVolt	6.0	35.0	0.1	VOLT	YES	16.0
8	Service Due	ServiceDue	1	999	1	HOUR	NO	250

Sensor Parameter Settings

S. No.	Parameter	Display	Min	Max	Step Size	Unit	Exit	Default Setting
1	Fuel Level Check	F-Snsr	DISABLE	AI *	---	NONE	----	DISABLE
2	Low Fuel Level	LoFuelLevl	1	100	1	%	YES	20
3	Low Fuel Level Delay	LoFuelDly	1	999	1	SEC	NO	5
4	High Temperature Check	T-Snsr	DISABLE	AI *	---	NONE	---	DISABLE
5	High Temperature	HiCIntTmp	10	120	1	^{0}C	YES	90
6	High Temp.Supervision Delay	HCntTmpDly	1	999	1	SEC	NO	5
7	Low Oil Pressure Check	P-Snsr	DISABLE	AI *	---	NONE	---	DISABLE
8	Low Oil Pressure Level	LOilPsr	1	10	0.1	Bar	YES	2
9	Low Oil Pressure Delay	LOilPsrDly	1	999	1	SEC	NO	5

* Can be used as Digital Input also.

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 Close	1	Digital Close	1	Digital Close
2	Digital Open	2	Digital Open	2	Digital Open
3	VDO Ohm*	3	VDO 120 deg C*	3	VDO 5 Bar*
4	VDO Tube Type	4	Datcon High*	4	VDO 10 Bar*
5	US Ohm	5	Datcon Low*	5	Datcon 5 Bar
6	GM Ohm (0-90)*	6	Murphy*	6	Datcon 10Bar
7	GM Ohm (0-30)*	7	Cummins*	7	Datcon 7 Bar
8	Ford	8	PT-100	8	Murphy 7 Bar
9	Set-F1*	9	Veglia*	9	CMB812*
10	User Defined**	10	Beru*	10	Veglia
		11	VECF*	11	VECF*
		12	Set-T1*	12	Set-P1*
		13	User Defined**	13	User Defined**

* If input signal is negative (shorted to Batt -ve) it raise alarm and stop the DG
** Depends upon the user configuration.

Technical Data

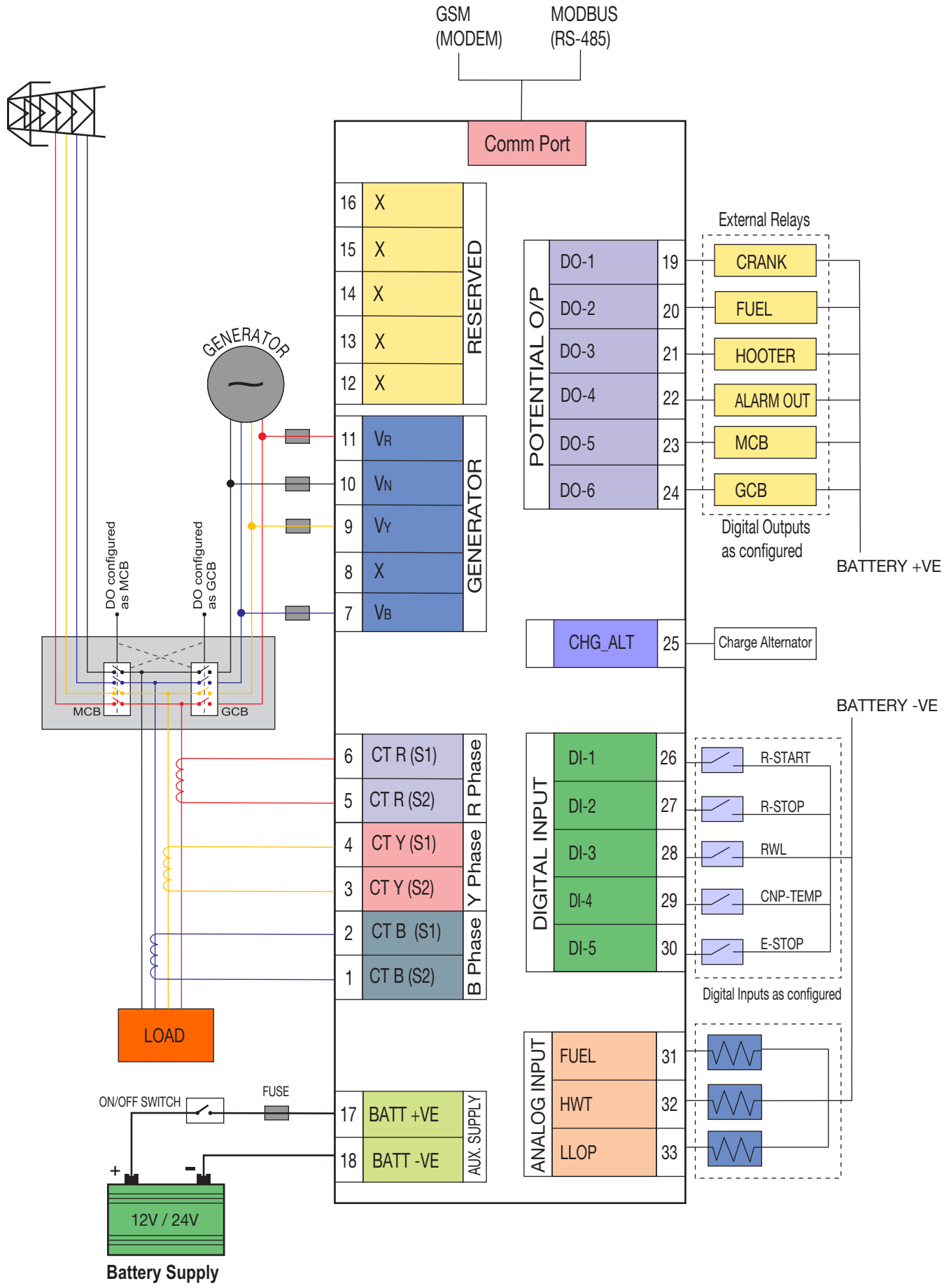
(a) Performance Specification

S.No	Parameter	Specification
1	Aux. supply	7–35V DC
2	Aux. supply Interruption Time	Half second sustains battery dip down to zero volts without requiring external capacitor bank.
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 current5A
7	Secondary current measurement	0.1 - 7A
8	Battery voltage supervision	6.0 - 35.0V (DC)

(b) Measurement Accuracy

S.No	Parameter	Specification
1	Voltage measuring tolerance	± 1%
2	Freq. measuring tolerance	± 1%
3	Tolerance of VBatt measurement	± 2%
4	Current measurement tolerance	± 2%
5	Energy measurement tolerance	± 2%

Typical Connection Diagram



Terminal Description

Terminal No.	Connection Name	Connection Description	Connection Type
1	CT_B (S2)	B Phase Load (Out)	Secondary Current
2	CT_B (S1)	B Phase Load (In)	
3	CT_Y (S2)	Y Phase Load (Out)	
4	CT_Y (S1)	Y Phase Load (In)	
5	CT_R (S2)	R Phase Load (Out)	
6	CT_R (S1)	R Phase Load (In)	
7	V_B	B Phase Voltage	Generator Voltage Input
8	x	Not Connected	
9	V_Y	Y Phase Voltage	
10	V_N	Neutral Voltage	
11	V_R	R Phase Voltage	
12	x	Not Connected	Reserved
13	x	Not Connected	
14	x	Not Connected	
15	x	Not Connected	
16	x	Not Connected	
17	BATT +ve	Battery Voltage +	Auxiliary Power Supply
18	BATT -ve	Battery Voltage -	
19	DO-1	Relay-1	Potential Output
20	DO-2	Relay-2	
21	DO-3	Relay-3	
22	DO-4	Relay-4	
23	DO-5	Relay-5	
24	DO-6	Relay-6	
25	CHG_ALT	Charge Alternator	Combined Input-Output
26	DI-1	Digital Input-1	Digital Input
27	DI-2	Digital Input-2	
28	DI-3	Digital Input-3	
29	DI-4	Digital Input-4	
30	DI-5	Digital Input-5	
31	FUEL	Fuel Level Low	Analog Sensor Input*
32	HWT	High Coolant Temperature	
33	LLOP	Low Lube Oil Pressure	

* can be used as digital input also

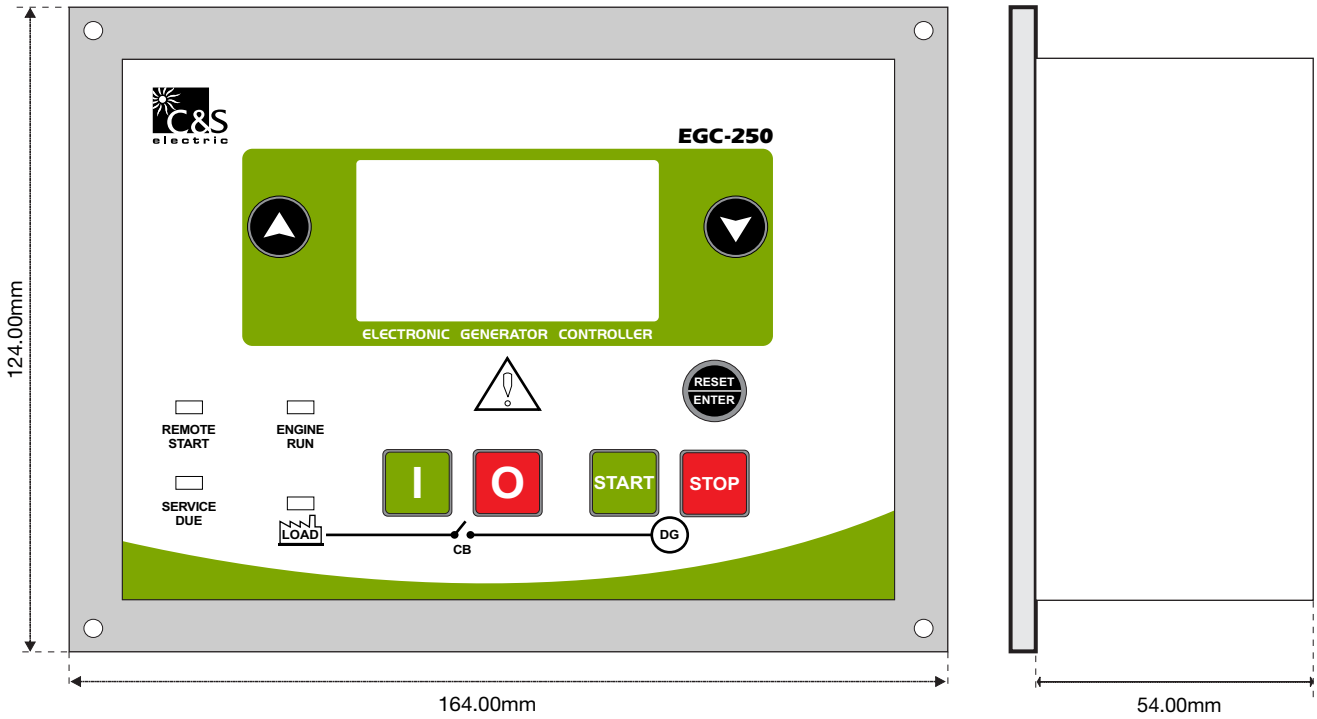
SPECIAL NOTE:

- ❖ DG Body (Battery-Ve) should be earthed properly.
- ❖ Use separate+Ve & -Ve supply from DG battery terminal for EGC-250. Do not Loop this wires to any other wires in side the control panel.
- ❖ Use RC snubber networks across contactor coil.
- ❖ Use RC filter across Start & Stop relay contacts.
- ❖ Use seperate trays for AC & DC wirings.
- ❖ Please make sure that all above conditions are fulfilled properly for trouble free operations of the EGC-250.
- ❖ Put free wheeling diodes across relay coil in external relay card.

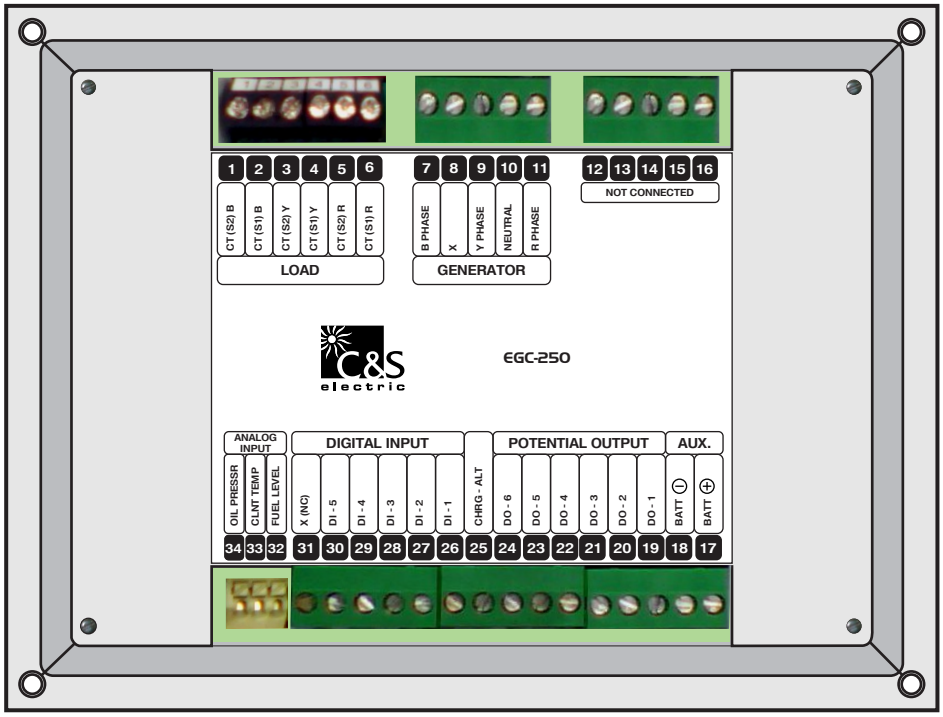
Dimension Details

Front view

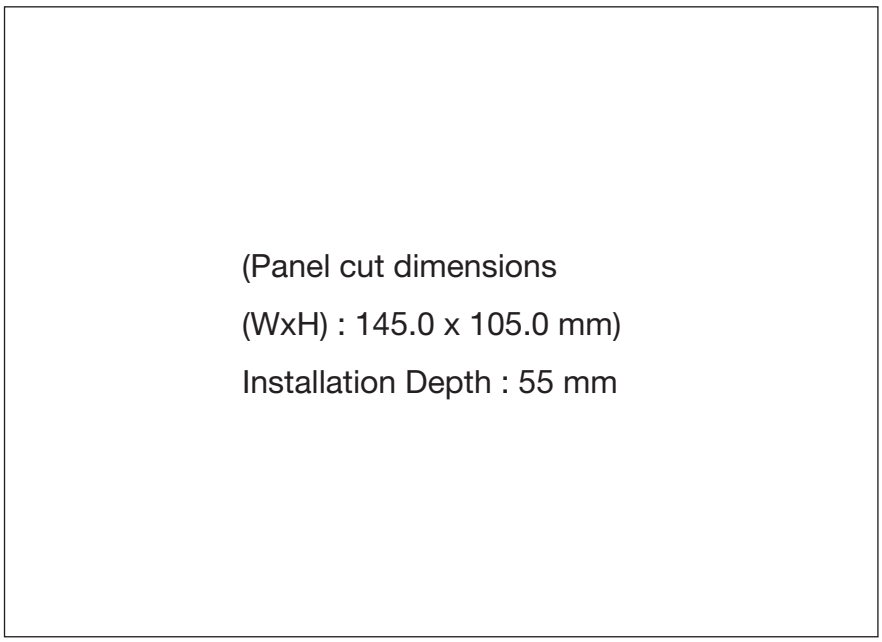
Side view



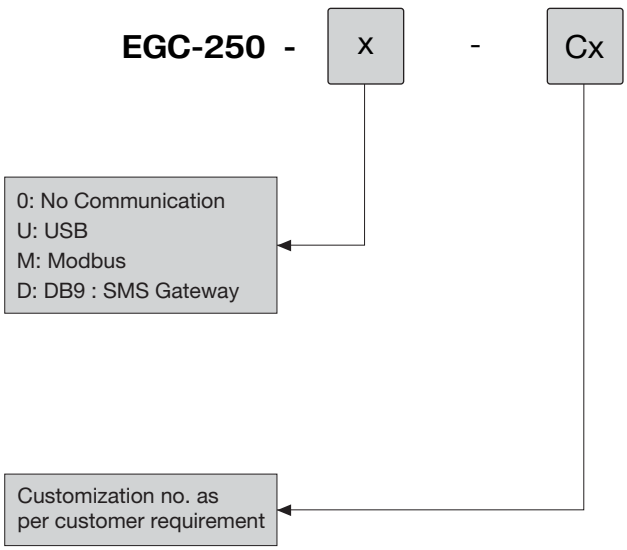
Back view



Panel Cut out Details



Ordering Information



Revision History

S.No.	Rev.No.	Details	Date
01	01	Inclusion of Text in “Features” Heading	23.01.15

For further information, please contact:

C&S Electric Ltd.
(Protection & Measurement Devices)

C-60, Wing-A, Phase-II, Noida-201 305, District Gautam Budh Nagar (U.P) INDIA
Phone : +91-120-3874800 / 01, Fax: +91-120-3874802 E-mail: cspc@cselectric.co.in

REVISE
OR ELSE

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Branch office

Branch	Phone	Fax	E-mail
Ahmedabad:	+91 79 30074534/35/36	+91 79 30074519	cspc.ahmedabad@cselectric.co.in
Bangalore:	+91 80 3057 0372/73, 3057 0347	+91 2558 4839	cspc.bangalore@cselectric.co.in
Bhubaneswar:	+91 674 2507265	+91 674 2507265	cspc.bhubaneswar@cselectric.co.in
Chennai:	+91 44 3918 0531-35	+91 44 39180514	cspc.chennai@cselectric.co.in
Cochin:	+91 0484 3071717	+91 0484 3071716	cspc.cochin@cselectric.co.in
Delhi:	+91 11 338490 00-11	+91 11 30838826	cspc.delhi@cselectric.co.in
Hyderabad:	+91 40 3918 2496/97	+91 40 3910 3631	cspc.hyderabad@cselectric.co.in
Kolkata:	+91 33 22275850/51	+91 33 2227 5849	cspc.kolkata@cselectric.co.in
Mumbai:	+91 22 30487146/47/48	+91 22 2412 6631	cspc.mumbai@cselectric.co.in
Pune:	+91 20 30283244/45	+91 20 30283244	cspc.pune@cselectric.co.in