

### Standard functions

#### **Engine control**

- Start preparation (preheater or prelubrication)
- Start/stop sequences with selectable no. of start attempts
- Fuel solenoid selection (coil type)
- Idle speed control
- Local or remote start/stop
- Stop sequence with cool-down
- Running speed detection selectable
  - Charger alternator input (W terminal) or tacho generator
  - Binary input (D+)
  - Oil pressure based run detection
  - Voltage/frequency

#### **Generator monitoring**

- 3 or 1-phase generator monitoring
  - Voltage/current/frequency/power/reactive power

#### **Generator protection (ANSI)**

- Over-/undervoltage (27/59)
- Over-/underfrequency (81)
- Overcurrent (51)
- Reverse power (32)

#### **Engine monitoring**

- 3 configurable inputs
  - VDO or
  - 4-20mA from active transducer or
  - Binary with cable supervision
- 6 binary inputs, configurable
- RPM input, selectable
  - Magnetic pickup
  - NPN or PNP pickup
  - Tacho generator
  - Charger alternator W terminal

#### **Clear text display**

- 122 x 32 pixel backlight STN
- Graphic symbol messaging
- Clear text alarm messages
- Clear text diagnostics for both hardwired inputs and CANbus messages (J1939)
- Log book holding 30 log entries
- Real time clock for time and date

## Application

The Generator Controller GC-1 is a micro-processor based control unit containing all necessary functions for protection and control of a diesel engine. Furthermore, it contains a three-phase AC voltage measuring circuit. The unit is equipped with an LCD display presenting all values and alarms. GC-1 is a compact all-in-one unit designed for the following applications:

1. Automatic engine start/stop
2. Engine protection
3. Breaker control
4. Generator protection

Optional applications:

5. Automatic Mains Failure
6. CANbus J1939 engine communication

GC-1 automatically carries out a cyclical self test. If any errors are found, then the status relay output will deactivate (normally closed). In order to save battery power, the display can be set to switch off automatically after a given period of time.

The display will turn on again, if events or alarms take place, or if one of the push-buttons is activated.

## Setup

Setup is easily done via a PC Windows® based utility software (password protected) using the RJ11/RS232 PC connection. The PC interface box RJ11/RS232 needed for this operation is optional equipment for GC-1. The PC utility software offers additional features such as monitoring of all relevant information during commissioning, saving and downloading of settings and downloading of software updates. Furthermore, the most frequently used settings can be accessed via the display push-buttons (password protected).

## Options

The options selected by the customer will be integrated in the standard GC-1 hereby securing the same user interface unaffected by whether the application needs a basic or a more complex generator controller.

## Terminals

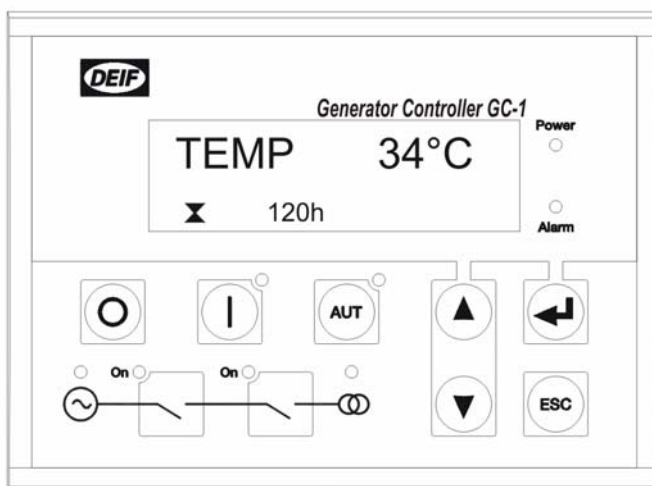
Terminal	Technical data	Description
4	Common for terminals 5-7	
5	VDO1, 4..20mA, dig. inp.	Fuel level/configurable
6	VDO2, 4..20mA, dig. inp.	Oil pressure/configurable
7	VDO3, 4..20mA, dig. inp.	Water temp/configurable
8-9	Tacho input	Magnetic pickup/PNP/NPN/tacho generator/charge alternator W terminal
10-11	Status out, 1 A 30V DC/V AC	General status output for marine approvals
12	Common	Common for term. 13-18
13	Digital input term. 13	Start enable/configurable
14	Digital input term. 14	Remote start/configurable
15	Digital input term. 15	Charge alternator D+ (running)/configurable
16	Digital input term. 16	Overspeed/configurable
17	Digital input term. 17	Coolant temperature/configurable
18	Digital input term. 18	Oil pressure/configurable
23	Common	Common for term. 24, 25 and 32 and emergency stop*
24	NO relay output 1, 2 A 30V DC/V AC	Horn
25	NO relay output 2, 2 A 30V DC/V AC	Alarm/configurable
26	Power supply – (gnd)	
27	Power supply + 6...36V DC	
28-31	Not used	
32	NO relay output 3, 2 A 30V DC/V AC	Start prepare/configurable
33-34	NO relay output 4, 8 A 30V DC/V AC	Run coil/stop coil/configurable
35-36	NO relay output 5, 8 A 30V DC/V AC	Starter (crank)/configurable
37	Generator L3 voltage	Voltage range 50-480V AC Ph-Ph value
38	Generator neutral voltage	
39	Generator L2 voltage	
41	Generator L1 voltage	
49-50	Generator breaker control relay, 2A 30V DC/V AC	
53	I L3 s2	Generator current L3
54	I L3 s1	
55	I L2 s2	Generator current L2
56	I L2 s1	
57	I L1 s2	Generator current L1
58	I L1 s1	

Optional AMF control		
43	Mains L3 voltage	Voltage range 50-480V AC Ph-Ph value
45	Mains L2 voltage	
46	Mains neutral voltage	
47	Mains L1 voltage	
51-52	Mains breaker control relay, 2A 30V DC/V AC	Configurable
Optional CANbus engine interface		
1	Can-L	Can J1939 engine communication
2	Can-GND	
3	Can-H	

**Available options**

Option	Description	Type	Note
<b>B</b>	<b>Generator protection</b>		
B3	Automatic Mains Failure <ul style="list-style-type: none"> <li>- Generator and mains breaker control</li> <li>- Change-over (no synchronisation)</li> </ul>	Software option	
<b>H</b>	<b>Communication</b>		
H5	CANbus J1939 <ul style="list-style-type: none"> <li>- Detroit Diesel DDEC</li> <li>- John Deere JDEC</li> <li>- Deutz EMR</li> <li>- Volvo Penta D12 AUX</li> <li>- Scania DEC</li> </ul>	Software option	
<b>J</b>	<b>Cables</b>		
J5	PI-1 converter box kit (for PC connection)	Hardware option	
<b>K</b>	<b>Documentation</b>		
K1	Installation Instructions and Reference Handbook (hard copy)	Other	
K2	CD-ROM with complete documentation	Other	
<b>L</b>	<b>Gasket for IP54</b>	Hardware option	

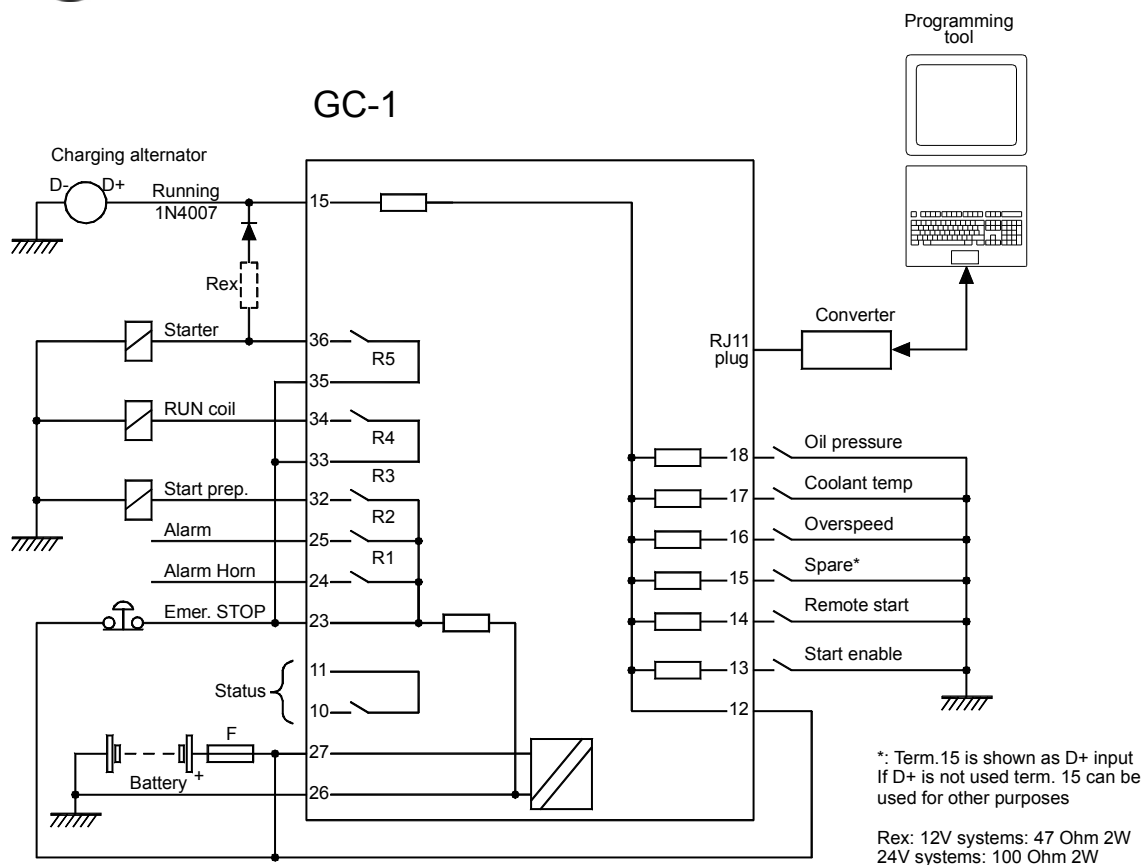
(ANSI# as per IEEE Std C37.2-1996 (R2001) in parenthesis).

**Option B3 display layout**

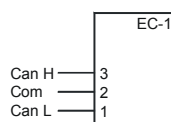
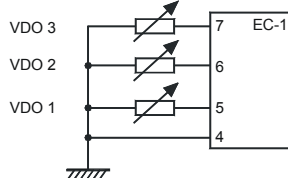
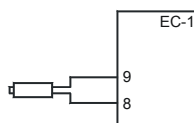
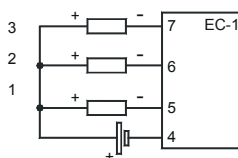
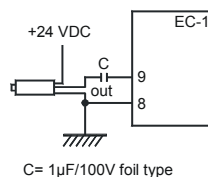
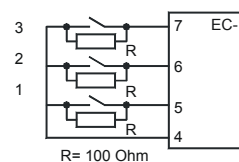
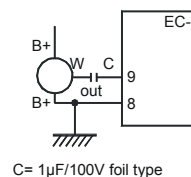
## Wiring, engine interface

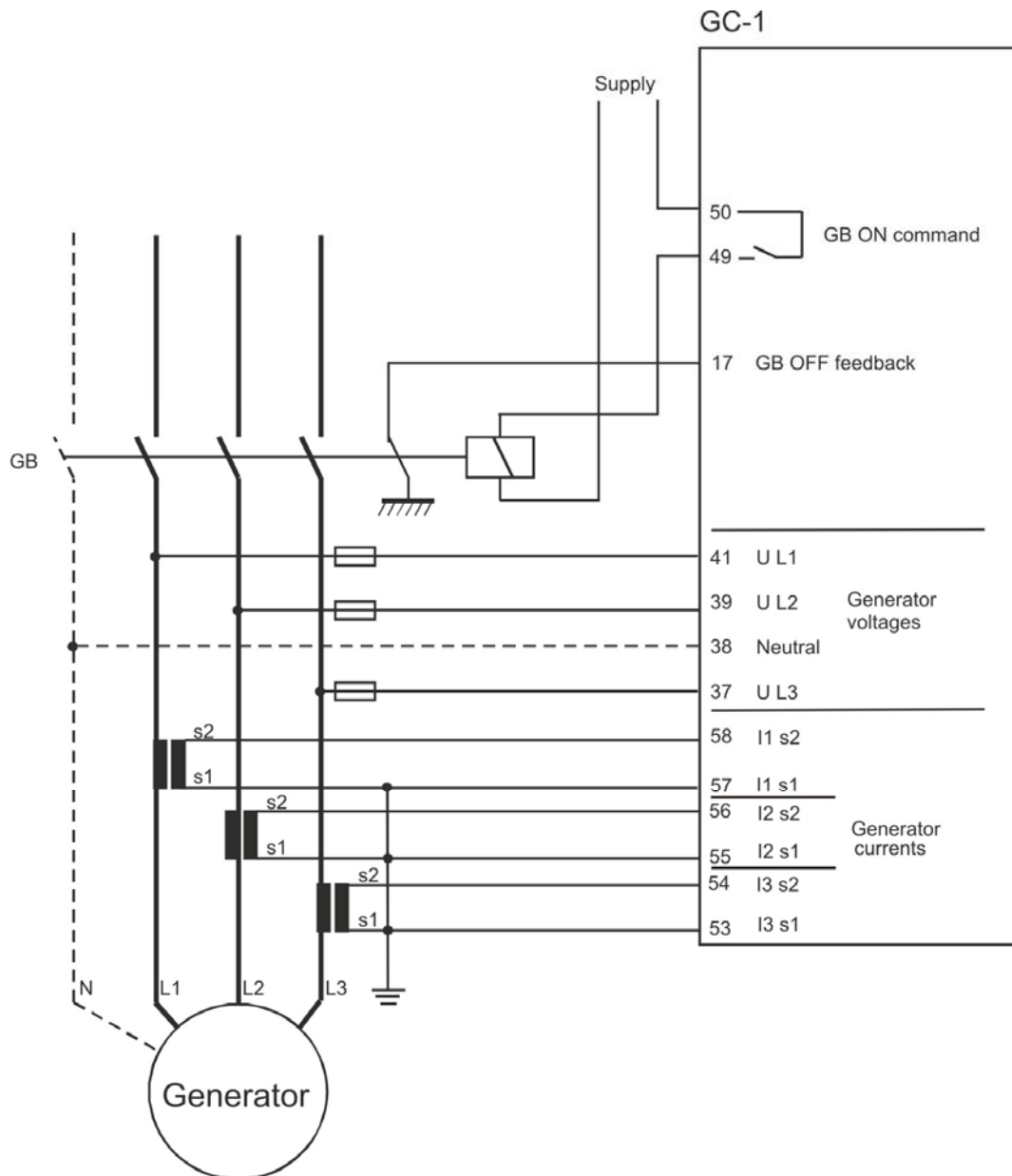


F: Fuse: 2A slow-blow.



## H5

Engine  
communicationMulti-functional inputs  
VDO sensorsTacho input  
Magnetic pickup/  
Tacho generatorMulti-functional inputs  
4-20 mA transmittersTacho input  
NPN/PNP pickupMulti-functional inputs  
Binary input w. cable superv.Tacho input  
W input from charger alternator

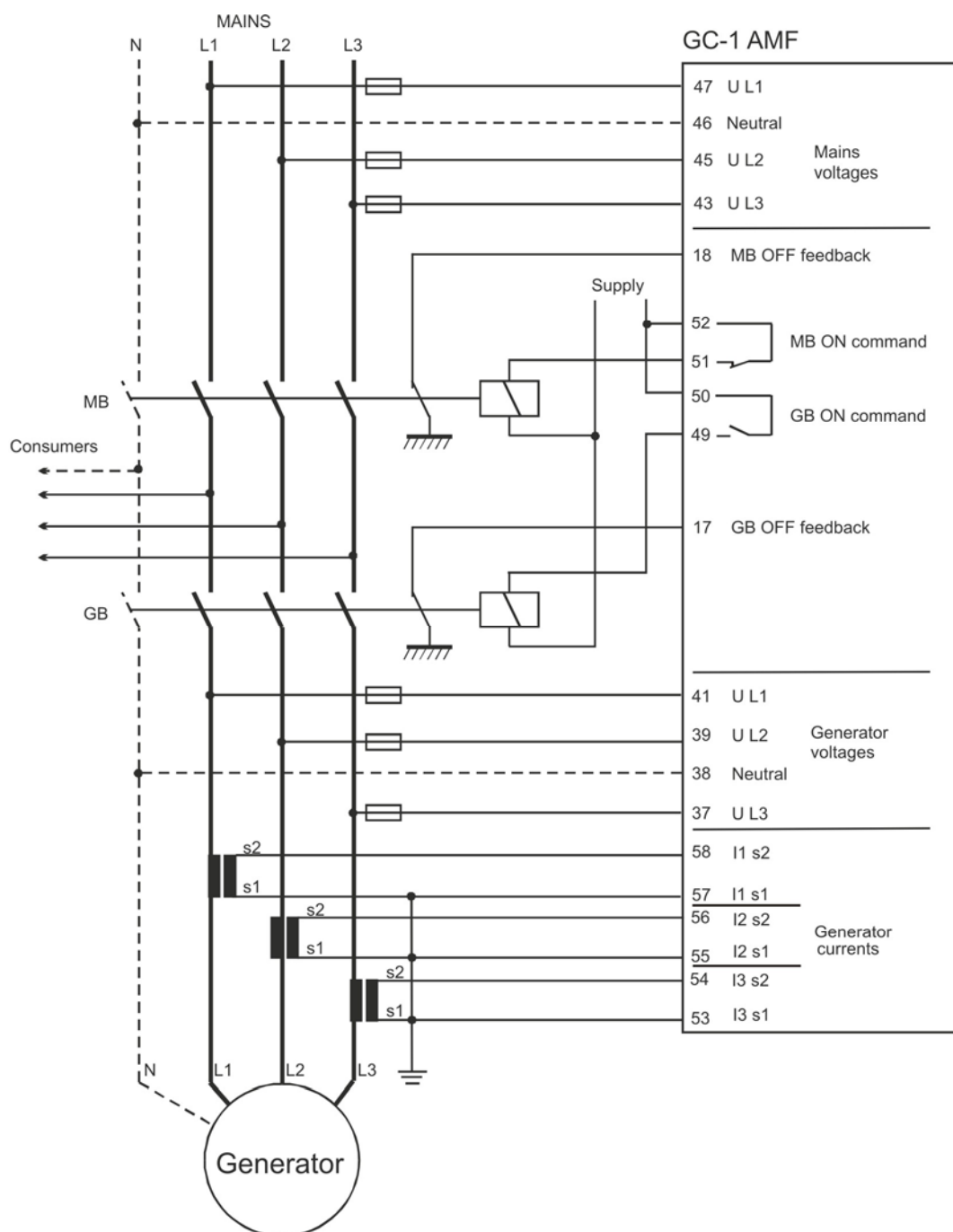
**Wiring, AC interface****Connection of the 3-phase voltage and current**

The AC current grounding can be made as required to s1 or s2.



**GB:** Use a contactor. The ON output from the GC-1 is a constant signal. Remember to use free-wheel diodes across the contactor coils, if DC voltage is used as supply for these.

**Fuse for AC voltage:** Max. 2A slow-blow.

**Wiring, AMF (option B3)**

The AC current grounding can be made as required to s1 or s2.



GB and MB: Use contactors. The ON outputs from the GC-1 AMF are constant signals. Remember to use free-wheel diodes across the contactor coils, if DC voltage is used as supply for these.

Fuse for AC voltage: Max. 2A slow-blow.

## Technical specifications

<b>Accuracy:</b>	Class 2.0 to EN 60688/IEC 688	<b>Active binary in internal voltage:</b>	
<b>Operating temp.:</b>	-25...70°C (-13...158°F)		Dry contact inputs (note 1) 4V DC supply, with cable supervision
<b>Storage temp.:</b>	-40...70°C (-40...158°F)	<b>Impedance:</b>	240Ω ~ 16mA
<b>Measuring input voltage:</b>	50...550V AC phase to phase	<b>Relay outputs:</b>	
<b>Load:</b>	1.5MΩ	5 relays:	30V DC/AC 2A
<b>Frequency:</b>	30...70Hz	2 relays:	30V DC/AC 8A
<b>Measuring input current:</b>	1 or 5A AC from current transformer	1 status relay:	24V DC 1A
<b>Consumption max.:</b>	0.3 VA/phase	<b>Mounting:</b>	Panel mounted
<b>Current overload:</b>	10A continuously, 20A, 5 sec.	<b>Size:</b>	78 x 106 mm (3.07" x 4.17")
<b>Pickup input voltage:</b>		<b>Climate:</b>	Class HSE, to DIN 40040
<b>Frequency:</b>	0.5...70V peak 10-10000Hz	<b>Display:</b>	122 x 32 pixel backlight STN
<b>Aux. supply:</b>	6-36V DC continuously Max. 8W consumption	<b>Safety:</b>	To EN 61010-1, installation category (overvoltage category) III, 600V, pollution degree 2
<b>Passive binary in voltage:</b>	Bi-directional optocoupler 8...36V DC	<b>Protection:</b>	Front: IP52 (IP54 with gasket, option L) Terminals: IP20 To IEC 529 and EN 60529
<b>Impedance:</b>	4.7kΩ	<b>EMC/CE:</b>	To EN 61000-6-1/2 SS4631503 (PL4) and IEC 255-3
<b>VDO inputs:</b>	Resistor inputs, internal 4V supply	<b>Material:</b>	All plastic materials are self- extinguishing according to UL94 (V1)
<b>Analogue input:</b>	From active transducer	<b>Plug connections:</b>	AC voltage inputs: 3.5 mm <sup>2</sup> multi-stranded AC current inputs: 4.5 mm <sup>2</sup> multi-stranded Other: 1.5 mm <sup>2</sup> multi-stranded
<b>Current:</b>	4...20mA	<b>PC connection:</b>	RS232 converter box (option J5)
<b>Impedance:</b>	50Ω	<b>Approval:</b>	CE & cUL (listing pending)
		<b>Weight:</b>	Approx. 0.9 kg (1.9 lbs)

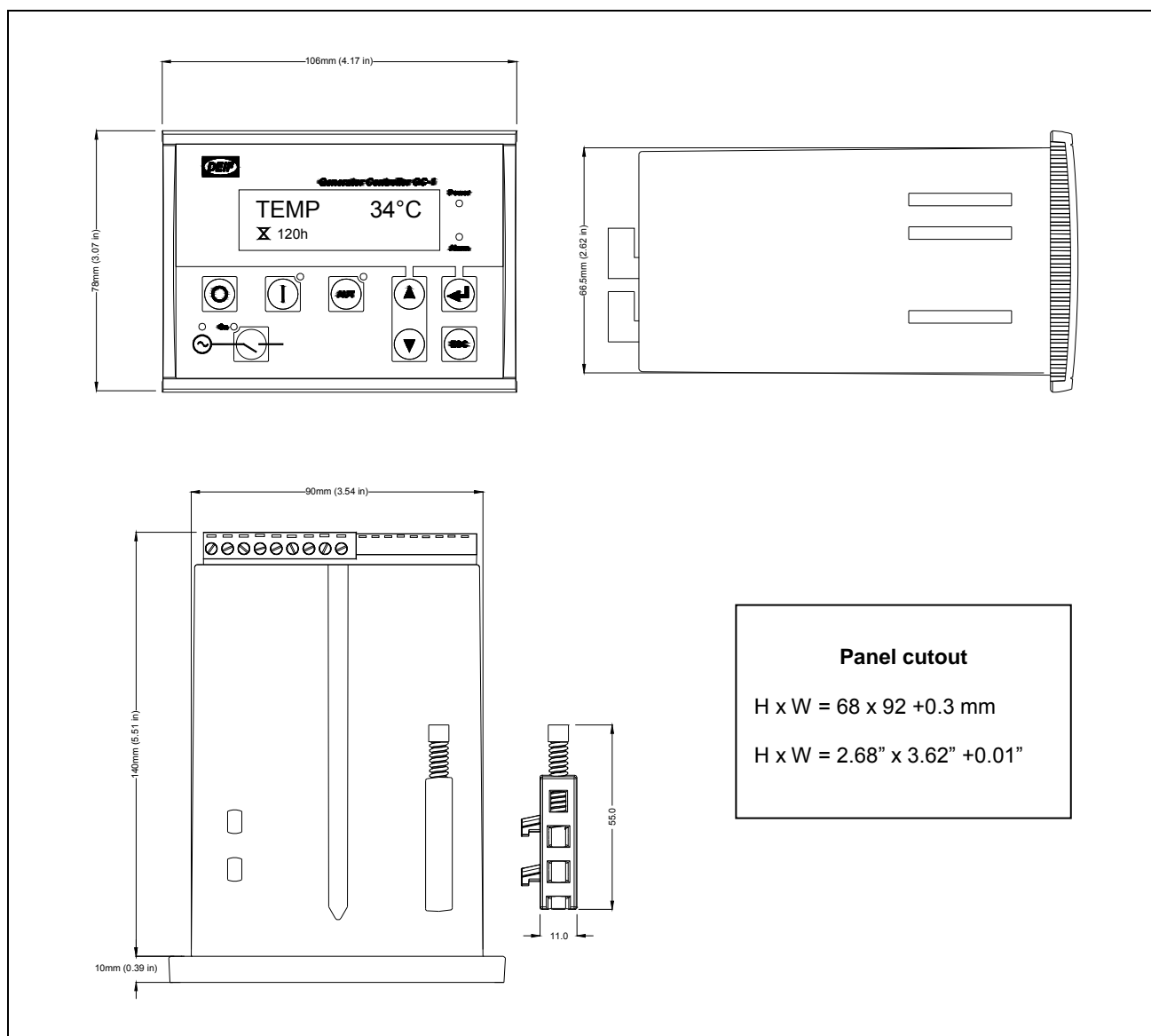


Only 3 inputs are available.

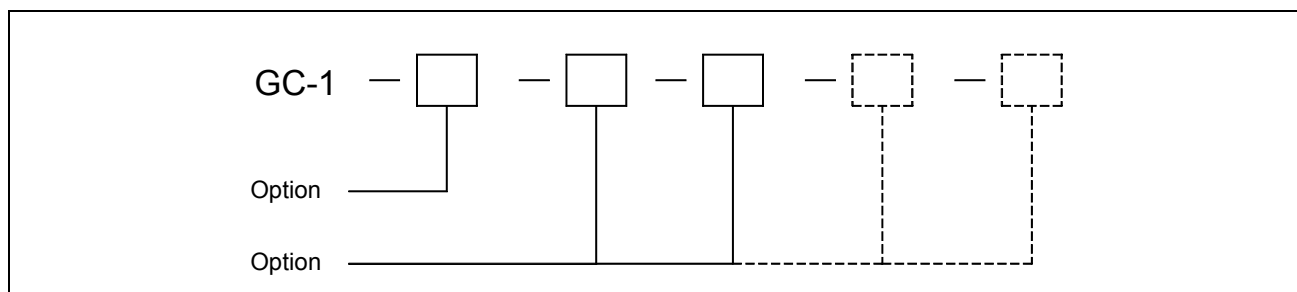


It is possible to combine VDO inputs with binary and 4...20mA inputs in a mix.

Unit dimensions in mm (inches)



Order specifications



Due to our continuous development we reserve the right to supply equipment which may vary from the described.



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