

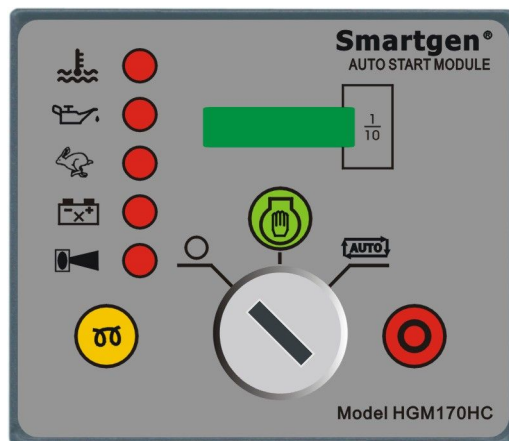
# Smartgen®

Genset units & ATS control

## HGM170/170HC

### AUTO START MODULE

### OPERATING MANUAL



SMARTGEN ELECTRONICS

## History

Version	Date	Content
1.0	2005-5-15	Original release.

# Smartgen<sup>®</sup>

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## DESCRIPTION

The **HGM170** auto start module is an engine control module designed to control the engine via a key switch and remote start signal or pushbuttons on the front panel. The module is used to start and stop the engine and indicate fault conditions, automatically shutting down the engine and indicating the engine failure by LED, giving true, first-up fault annunciation.

The module is housed in an enclosed robust plastic case for front panel mounting. Connections to the module are via plug and sockets.

The **HGM170hc** has a inbuilt LCD hours counter, which displays the number of hours that the generator has run, to the nearest 1/10 hour.

## SPECIFICATION

### DC Supply

8 to 35V continuous.

### Alternator Input Range

15 - 300VAC(+20%) RMS

### Alternator Input Frequency

50 - 60 Hz at rated engine speed.

Over speed: nominal frequency +14% (+24% Overshoot)

### Start Output

Relay 1A plant battery negative B- terminal

### Fuel Output

Relay 1A plant battery negative B- terminal

### Pre-heat Output

Relay 1A plant battery negative B- terminal

### Stop Output

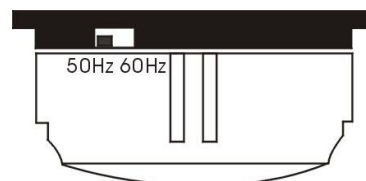
Relay 1A plant battery negative B- terminal

### Four switch Inputs

Switch to negative.

### Frequency select

Select 50Hz or 60Hz nominal



### Fixed Settings

**Crank Disconnect** : Generator voltage  $\geq 15$ VAC frequency  $\geq 15$ Hz

Charge Failure Voltage:  $\leq 3$ V

Remote start delay: 2seconds

Crank period: 5seconds

Crank rest: 10seconds

Safety delay: 10seconds

Remote stop delay: 10seconds

### Hours counter

Maximum hour counts: 99999.9h

**Case Dimensions**



84mm x 72mm x 35mm



**Operating Temperature Range**

-30 to +70°C

**ICON AND LED**




 : High temperature alarm LED




 : Low oil pressure alarm LED





 : Over speed alarm LED





 : Charge Failure warn LED



 : Common alarm LED


 : LCD hour counter
**OPERATION**


Operation of the module is via a three position key switch mounted on the front panel with OFF(O), START () and AUTO() positions. In the 'O' position the output are de-energized.

**Manual Operation:**


1. Select manual run ()
2. Depress pre-heat button for required length of time
3. Press START () to crank engine

Once the Start button is pressed and maintained, the engine fuel system is energized. After 1s, the 'Crank' output is then energized and the starter motor operated, disengaging automatically when the engine fires or when the 'Start' button is released. The protection hold-off timer is then initiated.

**Automatic Operation:**

1. Select AUTO()
2. When **Remote Start** is active, the generator will automatic start.

**Stop Operation:**

Turn the key to OFF(O) or press  button for over 1second, the engine will stop. The stop relay will energize for 30 second (maximum) or 5s(when the engine has

stopped).

Operation of any of the following alarms (which are close on fault) will cause the run output to de-energize:

- . **Low Oil Pressure**
- . **High Engine Temperature**
- . **Auxiliary Shutdown**
- . **Over speed**

This will remove the fuel supply from the engine and bring it to rest. Once activated no further alarm conditions will be accepted. The alarm output and relevant LED will remain active until the unit is reset by turning the switch to the 'O' position.

## OVER SPEED PROTECTION

Over speed protection is derived from the generator Hz output. The over frequency circuit monitors the generator Hz output and will shut down the engine immediately if a pre-set frequency level is exceeded. This trip level is 57Hz(50Hz nominal) or 68Hz (60Hz nominal).

## CHARGE FAILURE WARNING

Charge Failure Warning is also provided by monitoring the WL terminal on the charge alternator. This operates on a similar principal to the warning lamp fitted in a motor vehicle, should the output fail the charge fail LED will illuminate. The module will also provide the alternator excitation current via this connection.

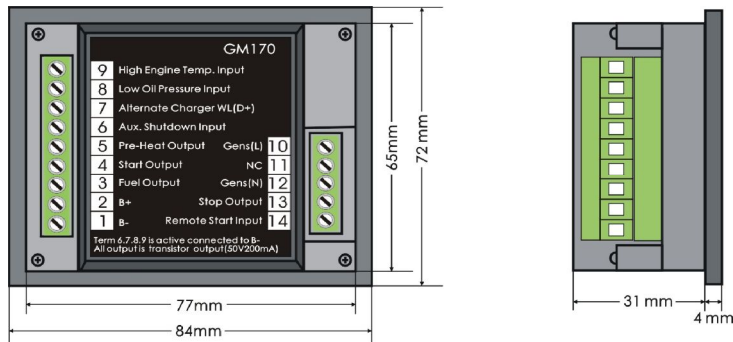
## TERMINAL DESCRIPTION

PIN NO	DESCRIPTION	CABLE SIZE	NOTES
1	DC Plant supply input (B-)	1.0mm	Connected to plant battery negative
2	DC Plant supply input (B+)	1.0mm	Connected to plant battery positive (Recommended Fuse 2A)
3	Fuel relay output	0.5mm	Used to operate the fuel solenoid control relay.
4	Start relay output	0.5mm	Used to operate the cranking control relay.
5	Preheat relay output	0.5mm	Used to operate the preheat control relay.
6	Auxiliary shutdown input	0.5mm	Switch to negative on fault.
7	Charge fail input/ excitation output	1.0mm	Must NOT be connected to plant supply negative if not used.
8	Low oil pressure switch input	0.5mm	Switch to negative on fault.

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PIN NO	DESCRIPTION	CABLE SIZE	NOTES
9	High engine temperature switch Input	0.5mm	Switch to negative on fault.
10	Alternator input L	1.0mm	2A Fuse
11	NC		
12	Alternator input N	1.0mm	
13	Stop relay output	0.5mm	Used to operate the stop control relay.
14	Remote start input	0.5mm	Switch to negative to start set.

### CASE DIMENSIONS



### TYPICAL CONNECTIONS

