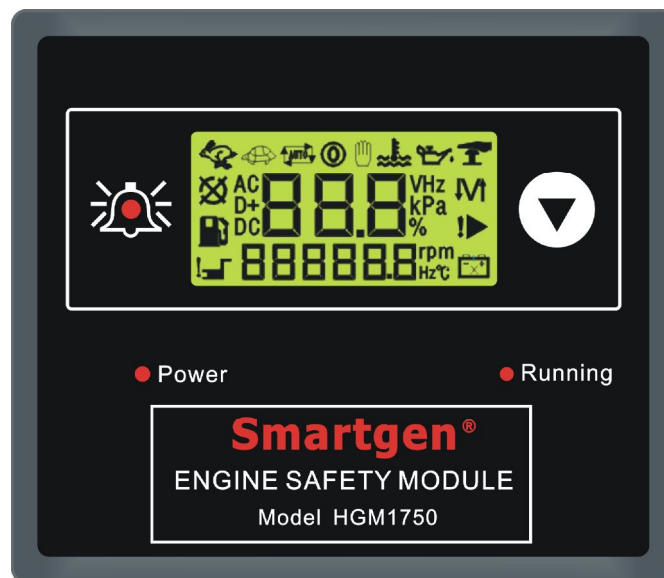


# Smartgen®

**HGM1750**

**Automatic Generator Module**

## **OPERATING MANUAL**



**Smartgen Electronics**

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## 1. Summary

HGM1750 for a generator/engine protection modules that can display the electricity generating/engine parameters (such as voltage, speed, temperature, generator pressure, fuel oil, etc.), also can position in detecting faults (hydraulic cylinder, low temperature, high temperature/emergency stop alarm, speeding, etc.) during shutdown command. Graphical LCD panel parameter and instructions provide valid fault condition of fault alarm signal.

## 2. Performance and characteristics

Using microprocessor as a core, graphics LCD with big screen and backlight, display and electrical parameters of oil and alarm.

Precision measure and display of

Generator voltage (V)

Generator frequency (Hz)

Generator temperature (°C)

Generator pressure (kPa)

Speed (rpm)

Generator hours count (h)

Start battery voltage (V)

Generator fuel level (%)

Control protection:

Oil pressure low

High temperature warning, shutdown

Low oil pressure warning, shutdown

A low fuel oil warning

High voltage power warning, shutdown

Over frequency alarm shutdown

Over speeding alarm shutdown

Emergency shutdown

Shutdown failure

Charge failure

Battery voltage high warning

Battery voltage low warning

- Through the software can be aiming for engine controller (controller does not choose power voltage input).
- A panel installation has red light-emitting diodes (LED) work and alarm status.
- A generator excitation function battery can provide.
- A speed signal desirable frequency speed sensor or electricity.
- A multiple temperature, pressure and oil level sensor can use directly, and can be custom curve.
- A switch quantity with programmable input, according to the needs of user can choose different functions.
- A LINK through programming mouth with PC test software parameters settings (using the company's production SG72 adapter), only a PC USB interface, in really machine parameters can be set up, also don't battery, by a PC to working controller provides USB power parameter settings.
- A modular structure design, ABS plastic casing, embedded installation,



compact structure, small volume, advanced MCU control, stable performance, convenient operation.

### 3. Specification










Item	Content
Operating voltage	DC8.0V to 35.0V, Continuous power supply
Power consumption	Waiting: 12V: 0.3W, 24V: 0.4W Work: 12V: 1W, 24V: 1.1W
Alternator input range	1P2L 30VAC - 360 VAC (ph-N)
Alternator input frequency	50/60Hz
Magnetic input range	1V to 24V
Magnetic input frequency	Max 15kHz
The biggest accumulative run time	99999.9 hour (After decimal point for 1/10 hour, namely 6 minutes varied once).
Stop relay output	7Amp
Alarm relay output	7Amp
Digital input	Connect the B- valid
Dimensions	88mm*76mm *44mm
Panel cutout	78*66mm
Operating temperature range	Temperature: (-30~70)°C Humidity: (20~90)%
Storage condition	Temperature: (-40~+80)°C
Protective level	IP55: When the control panel mounted between waterproof rubber rings. IP42: When the control panel mounted between waterproof rubber rings is not.
Insulation intensity	Object: In between the input/output/power Reference standard: IEC688—1992 Test method: AC1.5 kV / 1min 1mA leakage current
Weight	0.20kg

### 4. Operation

#### ◎ display panel

Item	Define	Description
	Page down /decrease	Page down, or in setting parameter status, pressing this key will decrease setting value.
	Alarm Led	When report to alarm, LED display.
Power	Power indicator	When the power is normal light controller.
Running	Operation indicator	When the engine start after the success of light.

## ◎ LCD ICO instruction

Item	Define	Item	Define
	WHT		Run
	OPL	AC	Gens Volt
	Over speed alarm	DC	Battery Volt
	Emergency stop alarm	rpm	Speed unit
V	Gens over volt	kPa	Oil press unit
	Fail to stop	V	Volt unit
	Start battery voltage abnormality	%	Fuel oil level unit
	Aux Alarm	℃	Temperature unit
	Fuel level low	Hz	Freq unit
		h	Generator hours count

## 5. Protection

1. Low oil pressure warning/stop: after a successful start-up, delay 10 seconds to begin testing, low pressure and last 2 seconds after the alarm or stop.
2. High temperature warning/stop: after a successful start-up, delay 10 seconds to begin testing, high temperature and last 2 seconds after the alarm or stop.
3. Low fuel oil level warning: when a low fuel below a preset fuel continues for 10 seconds, low fuel bits, this value only warning signal, don't keep.
4. Over speeding alarm stop: when the alarm speed for more than 2 seconds after the preset alarming downtime.
5. High voltage generator outage warning stop: when sampling voltage over preset 5 seconds, warning or stop.
6. Generator over frequency alarm shutdown: when frequency for more than 2 seconds after the preset alarming shutdown.
7. High battery voltage: when the battery voltage over 10 seconds, preset a warning signal voltage battery, don't stop.
8. Lower battery voltage: when the battery voltage continue below the default values for 10 seconds, lower cell voltage warning signal, without stopping.
9. Emergency stop: when the emergency stop input, output, immediately to stop an emergency stop alarm signal.
10. Charging failure: starting, delay 10 seconds began testing, when charging machine D + (WL) voltage 3V below and lasts 5 seconds, charging failure alarming signals, don't stop.
11. Shutdown failure: when the alarm controller, on delay shutdown command, if still end on a warning, don't stop failure.
12. Common alarm: when over speeding, over frequency, over volt , high temperature, low oil pressure, emergency shutdown, shutdown failure, charging failure, battery over voltage, battery under voltage(pre-alarm), panel alarm lights flashing, alarm relay output.

**Description:****The protection of the judge success when starting conditions:**

1. When the oil pressure be more than 200kPa.
2. When generator frequency more than nominal value for 40% of the frequency, (When rated frequency for 50Hz, setting value for 20Hz).
3. When the engine speed more than 40% of the rated speed setting (600 R.P.M., when the rated speed for 1500RPM).

If meet any more, think start-up success, while the protection.

## 6. Parameter range and define

### 6.1 parameters table (table 1)

Num	Parameter	Range	Default	Remart
1	High temperature shutdown	(50-140)°C	102	When the external temperature sensor is greater than this value, the temperature too high a temperature alarm the stop signal. When setting value equal to 140, not only a high temperature of the temperature sensor signal (not including temperature is exorbitant, switch quantity alarm signal).
2	High temperature warning value	(50-140)°C	95	When the external temperature sensor is greater than this value, the temperature too high a temperature warning alarm, without stopping. When setting value equal to 140, not only a high temperature of the temperature sensor signal (not including temperature is exorbitant, switch quantity alarm signal).
3	Low oil pressure shutdown value	(0-600)kPa	103	In the engine running process when external pressure sensor is less than the value of pressure, low pressure alarm the stop signal. When setting value equal to 0, not a low pressure (pressure sensor signal, not including low pressure switch quantity alarm signal).

Num	Parameter	Range	Default	Remart
4	Low pressure warning value	(0-600)kPa	124	In the engine running process when external pressure sensor is less than the value of pressure, low pressure warning alarm, without stopping. When setting value equal to 0, not a low pressure (pressure sensor signal, not including low pressure switch quantity alarm signal).
5	Low fuel oil level warning	(0-100)%	10	When the external level sensor level than the value and lasts 10 seconds, a warning signal low level, the value only warning, when set to 0 not detection of low position of fuel.
6	Generator rated voltage	(80-300)V	230	The rated voltage phase generators.
7	Generator over voltage shutdown	(20-150)%	150	When power voltage values and above this lasts 5 seconds that power voltage, high voltage power outage warning. When set to 150% high voltage, detection signal.
8	Generator over voltage warning value	(20-150)%	115	When power voltage values and above this lasts 5 seconds, namely that high voltage power generating over voltage warning, alarm, without stopping. When set to 150% high voltage, detection signal.
9	Generator rated frequency	(25-60)Hz	50	The rated voltage phase generators.
10	Generator over frequency value	(20-150)%	115	When the generator frequency than the value and lasts for three seconds that had made, and, when the stop signal frequency alarm set the value for 150, don't ever detection.
11	Generator pole	(2-16)pole	4	A number of generators.
12	Flywheel teeth	(10-300)	118	
13	Engine rated speed	(750~5000)r pm	1500	

Num	Parameter	Range	Default	Remart
14	Over speeding shutdown	(20-150)%	115	When the engine speed than the value and lasts for three seconds that a speeding, speeding the stop signal, when the alarm set to 150, don't test for speeding
15	Battery over volt	(12-40V)	33.0	When generator battery voltage is over than the point and hold for 10seconds, battery over voltage signal is active. It's a warning alarm.
16	Battery under volt	(4-30V)	8.0	When generator battery voltage is less than the point and hold for 10 seconds, battery under voltage signal is active. It's a warning alarm.
17	ETS solenoid hold	(1-120)S	20	It's the delay for energizing to stop.
18	Programmable switch input	(0-7)	2	The factory default for: external downtime alarm input
19	Programmable switch input delay	0-20.0S	2.0	Programmable input port entered a valid delay time
20	Select temp sensor	(0-10)	06	SGD(120°C)
21	Select press sensor	(0-10)	06	SGD(10Bar)
22	Select liquid level sensor	(0-7)	0	Not used

## 6.2 Programmable output (table 2)

Num	Description	Remarks
0	Not used	
1	External warning alarm input	If the signal is valid only warning, non-stop
2	External shutdown alarm input	If the signal generator, will stop immediately give an alarm
3	Reserved	
4	Reserved	
5	Reserved	
6	Reserved	
7	Reserved	

## 6.3 Sensor (table 3)

Num	Item	Content	Remark
1	Temperature	0 Not used	Defined curve input



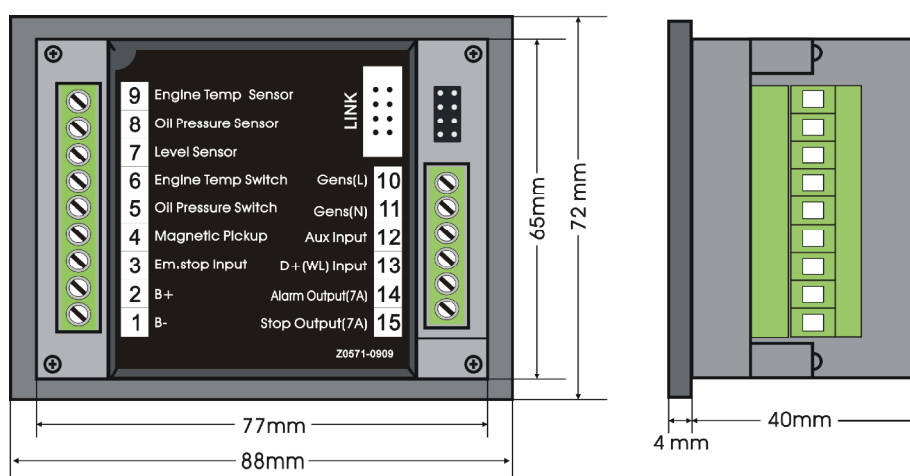
Num	Item	Content	Remark
	sensor	1 Digital input(Low) 2 Digital input(High) 3 Defined curve 4 VDO 5 SGH 6 SGD 7 CURTIS 8 DATCON 9 Reserved 1 10 Reserved 2	resistance range is 0-999.9 ohm, default is SGD.
2	Oil pressure Sensor	0 Not used 1 Digital input(Low) 2 Digital input(High) 3 Defined curve 4 VDO 10Bar 5 SGH 6 SGD 7 CURTIS 8 DATCON 10Bar 9 Reserved 1 10 Reserved 2	Defined curve input resistance range is 0-999.9 ohm, default is SGD.
3	Fuel oil level sensor	0 Not used 1 Digital input(Low) 2 Digital input(High) 3 Defined curve 4 SGH 5 SGD 6 Reserved 1 7 Reserved 2	Defined curve input resistance range is 0-999.9 ohm, default is not used.

## 7. Connecting Terminal

- ☐ Pin1 (B-): System DC negative input. (Battery Negative).
- ☐ Pin 2(B+): System DC positive input. (Battery Positive).
- ☐ Pin 3(Em. stop input): Plant Supply +ve. Also supplies fuel & start outputs.
- ☐ Pin 4 (Magnetic pickup): Head signal input, suggest using shielded wire, shielding layer one-port grounding.
- ☐ Pin 5 (Oil Pressure Switch): Low oil pressure switch input ports, connect to B - effectively.
- ☐ Pin 6(Engine Temp Switch): High temperature water/cylinder switch input ports, connect to B - effectively.
- ☐ Pin 7(Level Sensor): Liquid level sensor input, but circumscribed fuel level sensor.
- ☐ Pin 8(Oil Pressure Sensor): Oil pressure sensor input.
- ☐ Pin 9(Engine Temp Sensor): High temperature/temperature sensor input VAT.
- ☐ Pin 10(L), 11 (N): External generator voltage signal, the judge success and provide over clocking protect start-up.

- Pin 12(Aux Input): Programmable switch input ports, connect to B- effectively.
- Pin 13(D+ Input): After charging WL generator (or D +) terminals, internal controller provides charger exciter current. When the battery charging generator (i.e. failure in the operation process of the D + voltage < 3V), (Rechargeable battery failure alarming out when failure, only alarm).
- Pin 14(Alarm Output): Alarm output voltage output (B +) contacts capacity 7A.
- Pin 15(Stop Output): ETS solenoid to stop export (B + voltage output), Contacts capacity 7A.
- PC programming socket (LINK): Use SG72 programming cable connected to the PC USB parameter programming.

## 8. Dimensions (Panel cutout 78\*66mm)



## 9. Installation

