HGM150 Genset Control Module

USER MANUAL

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Software Version

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Note</th>
</tr>
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<tbody>
<tr>
<td>2006-05-08</td>
<td>1.0</td>
<td>Original release</td>
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<tr>
<td>2010-08-09</td>
<td>1.1</td>
<td>Optimize some details of the manual.</td>
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<tr>
<td>2011-06-13</td>
<td>1.2</td>
<td>Change the name of the company “Smartgen electronics” to “Smartgen Technology”.</td>
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<td>2011-12-22</td>
<td>1.3</td>
<td>Modify Typical Application.</td>
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1 SUMMARY

HGM150 is an engine protection module designed to control the engine via pushbuttons on the front panel. When detecting failures, such as low oil pressure, high water/cylinder temperature, over speed and external alarm, it will initiate shutdown/alarm signal. LED screen displays the faults, which can offer real and effective alarm information. It is of modular structure design, embedded installation, and compact structure with small volume, advanced SCM control, stable performance and convenient operation.

2 PERFORMANCE AND CHARACTERISTICS

◆ Wide range of DC supply input, 12V and 24V in common use;
◆ With low oil pressure, high water/cylinder temperature, over speed and external alarm protection;
◆ With ETS output. Crank disconnect output, alarm output and over speed output;
◆ LED displays all kinds of alarm states;
◆ Crank disconnect and over speed are decided by generator voltage, and over speed threshold can be set;
◆ Built-in dial switch to select frequency (See the picture).

3 SPECIFICATION

<table>
<thead>
<tr>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Voltage</td>
<td>DC8.0V to 35.0V continuous</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Standby (12V: 0.12W, 24V:0.24W) Working (12V: 0.5W, 24V:1W)</td>
</tr>
<tr>
<td>Alternator Voltage Input 1P2W</td>
<td>15VAC - 360VAC (ph-N)</td>
</tr>
<tr>
<td>Alternator Rated Freq.</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Over Speed Freq.</td>
<td>Default: 114% of rated freq.</td>
</tr>
<tr>
<td>Condition of Crank Connect</td>
<td>Generator voltage ≥15VAC and frequency ≥15Hz</td>
</tr>
<tr>
<td>Charge Failure Voltage</td>
<td>&lt;3V</td>
</tr>
<tr>
<td>3 Digital Inputs</td>
<td>Connect to B- active</td>
</tr>
<tr>
<td>Start Output</td>
<td>1Amp DC28V relay output B+</td>
</tr>
<tr>
<td>Stop Output</td>
<td>1Amp DC28V relay output B-</td>
</tr>
<tr>
<td>Common Alarm Output</td>
<td>1Amp DC28V relay output B-</td>
</tr>
<tr>
<td>Over Speed Output</td>
<td>1Amp DC28V relay output B-</td>
</tr>
</tbody>
</table>
### Item | Contents
--- | ---
Case Dimensions | 84mm x 72mm x 35mm
Panel Cutout | 78mm x 66mm
Operation Condition | Temperature: (-30~+70)°C  Humidity: (20~90)%
Storage Condition | Temperature: (-40~+80)°C
Protection Level | IP55: when waterproof rubber gasket added between controller and its panel.  
IP42: when waterproof rubber gasket not added between controller and its panel.
Insulation Intensity | Object: among input/output/power  
Quote standard: IEC688-1992  
Test way: AC1.5kV/1m  3mA leakage current
Weight | 0.2kg

### 4 PANEL OPERATION

- **Lamp test (オン)**: press this key at least 1 second, all the indicators in the panel will illuminate. It will test whether the indication lights are normal or not.
- **Alarm reset (オフ)**: when module had failure and alarm, press this key to reset the alarm.
- **Parameter configuration (設定)**: can be used for setting over speed threshold of generator. Setting procedures are as following:

  1. Disconnect the module power (B+), press key and hold, then turn on
the module power. If over speed indicator is flashing rapidly, it means that over speed threshold can be set.

2) Adjust engine speed to a specified over speed value, press, all indicators illuminate; over speed threshold is the current rotating speed. The valid range to set value is (51-75) Hz. Over speed can be set repeatedly by pressing.

3) During setting over speed, if engine speed is over the pre-setting, will always illuminate; if it is under the pre-setting, will rapidly illuminate. This can judge whether the over speed threshold is successfully set or not.

4) During setting, pressing can resume the factory default: 114% of rated frequency.

5) When the setting is completed, turn off the power to exit the setting state.

5 TERMINALS FUNCTION

◆ Terminal 1 (B-): Connected to plant battery negative (GND).
◆ Terminal 2 (B+): Connected to plant battery positive.
◆ Terminal 3 (ETS Output): When module detects fault, the output is enabled and will disconnect after 3 seconds.
◆ Terminal 4 (Crank Disconnect Output): output when module detects output frequency more than 15Hz; disconnect when less than 15Hz.
◆ Terminal 5 (Alarm Output): When module detects fault, the output is enabled and will disconnect after resetting the alarm or turning off the power.
◆ Terminal 6 (Aux. Shutdown Input): auxiliary shutdown alarm input, connect to ground.
◆ Terminal 7 (Alternate Charger WL (D+)): Connect to alternator WL (or D+) terminal. When charge failure, annunciator on the front panel illuminates. (indication only, not shutdown)
◆ Terminal 8 (Low Oil Pressure Input): Low Oil Pressure Input port, connect to ground. The output will be enabled after 10s’ start delay.
◆ Terminal 9 (High Engine Temp Input): High water/cylinder temperature input port, connect to ground. The output will be enabled after 10s’ start delay.
◆ Terminal 10 (SIGNAL (+)), 12(SIGNAL (-)): Connect to AC voltage signal for judging crank disconnect and over speed protection. Voltage input range is
(20~300) V AC, rated frequency is 50/60Hz.

- Terminal 11 (NC): Not connection.
- Terminal 13 (Over Speed Output): When module detects output frequency more than pre-setting over speed threshold, it will output and hold after 3s’ delay and will disconnect after resetting the alarm or turning off the power.
- Terminal 14 (NC): Not connection.

6 TYPICAL APPLICATION
7 CASE DIMENSIONS (Panel Cutout 78 mm*66mm)

8 HGM170RE RELAY EXPANSION MODULE (Optional)

HGM170RE is modular structure which can be fixed in various guides with compact structure, small size and easy installation.

Expansion circuits output:
1. Fuel relay 30A, output voltage B+, coil power≤0.9W
2. Start relay 30A, output voltage B+, coil power≤0.9W
3. Stop relay 30A, output voltage B+, coil power≤0.9W
4. Auxiliary relay 30A, passive output, coil power≤0.9W

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CRANK CTRL</td>
<td>Start relay control, connect to ground.</td>
<td>HGM170RE terminals:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1: CRANK CTRL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3: FUEL CTRL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9: AUX CTRL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12: STOP CTRL</td>
</tr>
<tr>
<td>2</td>
<td>CRANK OUT</td>
<td>Start relay output, B+ output.</td>
<td>HGM150 terminal:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3: Stop Output</td>
</tr>
<tr>
<td>3</td>
<td>FUEL CTRL</td>
<td>Fuel relay control, connect to ground.</td>
<td>4: Crank Disconnect</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Output</td>
</tr>
<tr>
<td>4</td>
<td>B+</td>
<td>battery positive</td>
<td>5: Alarm Output</td>
</tr>
<tr>
<td>5</td>
<td>B+</td>
<td>Battery negative</td>
<td>13: Over speed Output</td>
</tr>
<tr>
<td>6</td>
<td>FUEL OUT</td>
<td>Fuel relay output, B+ output.</td>
<td>These terminals can be</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>arbitrarily</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td>Battery negative (GND)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>STOP OUT</td>
<td>Stop relay output, B+ output.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>AUX CTRL</td>
<td>Auxiliary relay control, connect to ground.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>AUX OUT1</td>
<td>Auxiliary relay output, free</td>
<td></td>
</tr>
</tbody>
</table>
11 AUX OUT2 contact normally opens. interconnected to control corresponding items.

12 STOP CTRL Stop relay control, connect to ground.

9 OVERALL DIMENSIONS OF HGM170RE

Note: When ordering please specify 12V or 24V.