

# Electronic Diesel Engine Speed Governor

## HT-SG-50

### Benefits

- Suits 12/24 VDC systems
- IP65 sealed
- Bi-directional CAN Bus enabled
- Clear LED Display (RPM default)
- Simple 3-button Interface
- RPM sent as std. J1939 value
- Idle speed
- 2 Speeds
- Droop
- Synch/Load-sharing via 0-10V analogue input or J1939 SpeedUP/SpeedDown
- External Speed Trim



## Smart Governing

The **HT-SG-50** is a simple and cost-effective electronic speed governor for conventional diesel engines. Its digital processing not only provides flexibility in configuration but also allows CAN J1939 data exchange with many modern controllers.

The unit will internally convert the signal from a standard inductive flywheel pick-up to an RPM value, display it on the 4-digit LED display and also send it as a standard J1939 value to a connected controller.

The unit's desired speed can also be set by standard J1939 SpeedUp/SpeedDown commands over the CAN Bus connection as well as by a conventional 0-10V synchronizing and load sharing signal input.

This J1939 integration simplifies the wiring, saves installation time and allows implementation of more sophisticated controller features.

InGovern smart speed controllers are fully potted for sealing and vibration resistance and suitable for mounting on or close to a running engine. They provide precise (<0.25%) isochronous rotational speed control.

The **HT-SG-50** is supplied pre-configured and once the number of flywheel teeth is input (1 x press of [Fn] button then [+] or [-] until the correct value is displayed) then the engine will run. All parameters are stored in non-volatile memory.

Fine tuning of the PID loop and other common features can be done using the same 3 buttons on the front panel.

The supplied PC software (which connects via a standard USB cable – no dongle required) provides an overview of all settings.

## Technical Specification

### Safety instructions and Warnings

Before installing and starting the device, please read the operating instructions. These contain important notes for safety and use.

No liability can be accepted for damage arising from failure to follow the instructions or any inappropriate use.

The governor may only be used for the manner of operation prescribed in the operating instructions and only in connection with third-party devices and components recommended or installed by us or software supplied by us. Any other use shall be considered inappropriate use and will result in the voiding of all liability and warranty claims against the manufacturer.

Interventions and alterations that influence the safety technology and the functionality of the governor may be carried out only by the manufacturer.

Fault-free and safe operation is conditional upon competent transport, assembly and installation as well as qualified use and correct maintenance.

All relevant accident prevention regulations and other generally recognised technical safety and health and safety at work rules are to be observed. Fault-free functioning of the machinery and its peripheral components is only guaranteed with original accessory parts and spare parts.

The **HT-SG-50** engine speed governor is robust enough to be placed in a control cabinet with other operating control devices or installed on the engine. If water, mist or condensation can come into contact with the controller, it should be mounted vertically, allowing the liquid to flow away from the controller. Extremes of heat should be avoided.

### Overspeed protection

#### **i** IMPORTANT

An overspeed shut down mechanism must be installed separately from the control system as a safety measure, to prevent engine faults that may result in damage or injury to machinery or persons.

### Installation and connection

#### General information

The pick-up cable should be shielded to guarantee that no electromagnetic interference can reach and affect the engine speed governor reading. The shield should be connected to the battery negative.

To maintain the correct distance between the flywheel and the RPM sensor, the sensor must be rotated in until the flywheel touches and then rotated out again for  $\frac{3}{4}$  of a rotation.

This achieves the correct spacing between flywheel and sensor. To be able to start the engine, the RPM sensor must generate at least 1V AC RMS during the start.

Cross-section of the battery and actuator cable at terminals A, B, C, and D:

**1.5 mm<sup>2</sup> for 24 VDC or 2.5 mm<sup>2</sup> for 12 VDC**

For longer cables (>5m) the cable cross-section is to be increased appropriately to keep the voltage drop low.

- Battery positive (+) input, connection M, should be fused 10 A.
- The governor should be installed such that the housing has connection with the chassis of the control cabinet.
- The cable of the actuator must be shielded along its entire length.
- The cable of the pick-up sensor must be shielded along its entire length.
- The cable of the variable RPM speed input can be up to 5m long. For longer cables, a shielded cable must be used.
- The shielding must always be grounded such that it does not come into contact with the chassis of the machine. This is to prevent stray signals from entering the governor and causing interference. The shield must be grounded at one end

### Connection terminals

Connection terminal	Description	Definition
C	Speed / Speed Trim	Speed / Speed Trim
D	+5VDC	Sensor feedback supply
E	GND	Ground
F	IDLE	Idle
H	EXT SPEED	Load distribution / synchronisation
I	GND	Ground
J	J+	Actuator (Plus)
K	K-	Actuator (Minus)
L	L-	Battery (Minus)
M	M+	Battery (Plus)
N	N-	Pickup (Ground)
O	O+	Pickup (Plus)
P	LO	CAN low
Q	HI	CAN high
R	DROOP	Droop

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## Accessing the functions

In SETUP mode, the functions listed below can be accessed using the [Fn] button.

Each press of the [Fn] button makes the next menu active. The active menu is shown on the LED display for 2 seconds, after which the relevant value of this function appears. Settings are changed with the arrow keys [-] [+] and raise/lower the value by 1.

If the arrow keys [-] [+] are held down longer, the value increases at a greater rate.

### Regular Mode

Normal operating mode	1500	RPM	e.g. 1500 rpm
[Fn] button: 1x press	GEAr/120	Number of teeth	e.g. 120 teeth
[Fn] button: 2x press	GAI/50.2	P value*	e.g. 50.2%
[Fn] button: 3x press	Int/21.9	I value*	e.g. 21.9%
[Fn] button: 4x press	dEr/7.0	D value*	e.g. 7.0%
[Fn] button: 5x press	droo/3.0	Droop %	e.g. 3.0%
[Fn] button: 6x press	1500	RPM display	e.g. 1500 rpm
[+] button: 1x press	2000→2001	Increase value by 1	for all parameters
[-] button: 1x press	2000→1999	Reduce value by 1	for all parameters
Press & Hold [Fn] button for 3 seconds To select Quick mode if required	qui	To select quick mode display	to access only PID Menus

\*Display of the values is dependent on input G (Gain). If this is open, parameter set 1 (Gain 1, Int 1 and Der 1) is shown; if the input is closed, parameter set 2 (Gain 2, Int 2 and Der 2) is shown.

### Quick Mode

Normal operating mode	1500	RPM	e.g. 1500 rpm
[Fn] button: 1x press	GAI/50.2	P value*	e.g. 50.2%
[Fn] button: 2x press	Int/21.9	I value*	e.g. 21.9%
[Fn] button: 3x press	dEr/7.0	D value*	e.g. 7.0%
[Fn] button: 4x press	1500	RPM display	e.g. 1500 rpm
Press & Hold [Fn] button for 3 seconds To select Regular mode if required	rEG	To select regular mode display	e.g. 1500 rpm

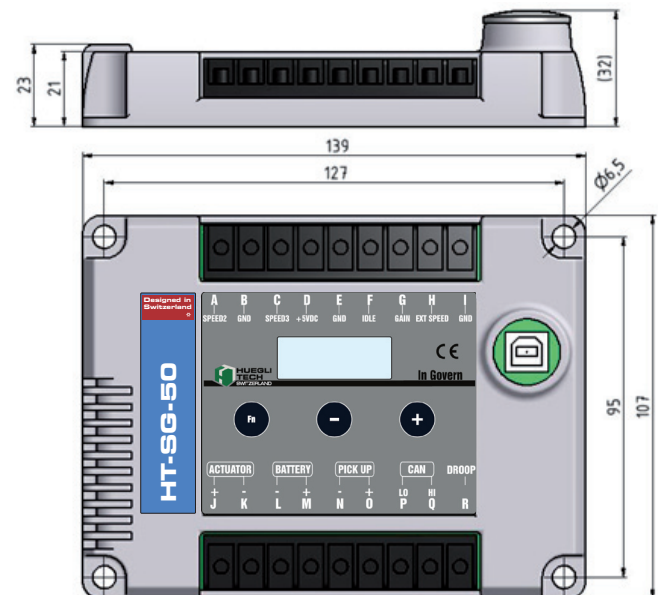
### General Features for all Types and Modes

Press & Hold [+] and [-] button for 3 seconds to know the firmware version	v 2.00	Working firmware version	Version 2.00
Press [Fn] and [-] button to exit from Menu display	1500	RPM display	e.g. 1500 rpm
[+] button: 1x press	2000→2001	Increase value by 1	for all parameters
[-] button: 1x press	2000→1999	Reduce value by 1	for all parameters

\*Display of the values is dependent on input G (Gain). If this is open, parameter set 1 (Gain 1, Int 1 and Der 1) is shown; if the input is closed, parameter set 2 (Gain 2, Int 2 and Der 2) is shown.

## Hardware use (Keypad) and Dimensions

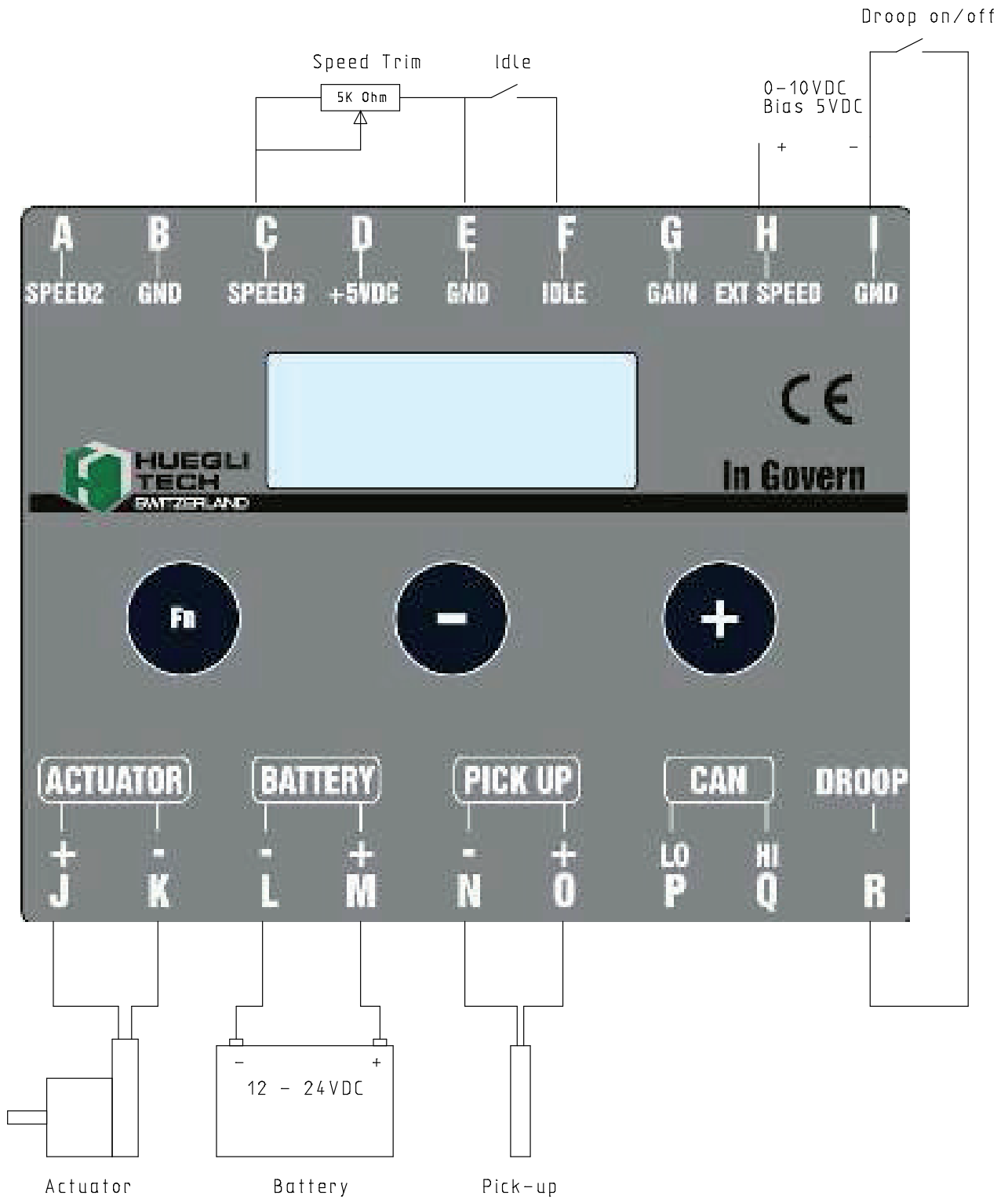
The HT-SG-50 has three menu buttons, with which allows parameters to can be set locally. The set values are indicated on the LED display. In normal operating mode, the RPM is indicated on the display.



# Electronic Diesel Engine Speed Governor

HT-SG-50

## Wiring Diagram HT-SG-50



# Electronic Diesel Engine Speed Governor

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## Technical Data

### Performance

Isochronous/stability.....±0.25%  
RPM range.....300 Hz - 8 KHz  
(112-4000 RPM for flywheel with 160 teeth)  
RPM variation with temperature.....±0.25% max.  
Idle adjustment.....Full Range  
Speed Trim.....Programmable 0-100%, (default = 5%)

### Surroundings

Temperature range.....-40° to 85°C (-40 to +185°F)  
Relative humidity.....up to 95%  
Surface finish.....Fungus Proof and Corrosion Resistant  
CE certificate..... EN61326-1

### Input/output parameters

Supply voltage.....12 or 24 VDC Battery, (6.5 VDC to 33 VDC)  
Polarity.....Negative Ground (housing isolated)  
Current Consumption.....90 mA max. continuous,  
(Excluding actuator drawn current)  
Max permitted actuator current.....8 A continuous (at 25°C)  
Engine speed sensor signal.....1 – 120 V RMS  
+5VDC Output (Terminal D).....up to 12 mA  
Load Share/Synchronizer Input.....0-10 VDC  
(5V nominal, reversed, 5 rpm/V)  
Reverse Power Protection.....Yes  
Transient Voltage Protection.....60V

### Norms/standards

Authorising office.....CE and RoHS requirements  
Communication.....SAE J1939

### Reliability

Vibration.....7G, 20-100Hz  
Shock.....20G Peak  
Inspection.....100% functionality inspection

### Mass and weight

Dimensions.....139 x 107 x 32 mm  
Weight.....0.372 kg  
Installation.....direct on engine chassis, preferably vertical,  
with rubber shock absorbers,  
insulated, or in control cabinet

### Configuration parameters

Number of flywheel teeth, range.....50 -255 teeth

## Local Distributor / Partner:



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