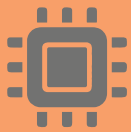


# Electronic Governor

(for diesel-electric locomotives)

Micro-controller Based Governor replace the mechanical hydraulic or electro hydraulic governor on Diesel engine Locomotives. The MCBG consists of Control unit, Actuator unit, Pressure sensors unit & Engine speed sensors.



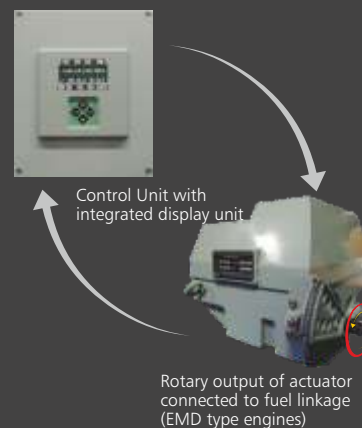
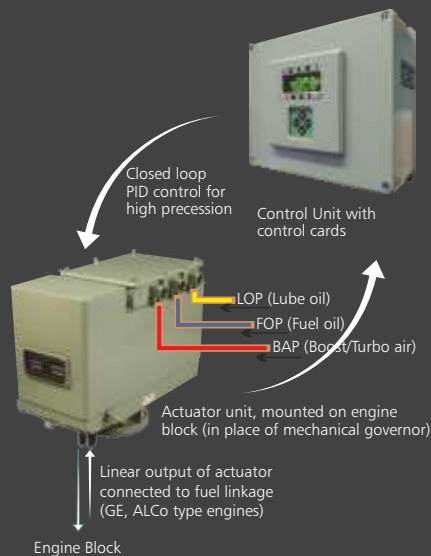
**Control unit** houses the electronic cards, display, keyboard, pen drive & USB port. 16 bit micro-controller used for fast and precise control of fuel rack movement. The unit can be interfaced with different type of loco control systems for maintaining different engine speeds. ECU regulates the Load control signal and communicates with loco control system to maintain constant Engine speed and HP in case of engine over load. In-built protection features for fault conditions includes over-speed, low lube oil pressure, actuator failure, etc. In-built OLED Display provides various engine parameters and fault messages. Can be mounted either beside driver control desk or in the control panel as per convenience;



**Actuator Unit** mounted on engine block, controls the loco fuel rack linkage through a stepper motor drive. Minimal moving parts and no lubricating consumables make it a low maintenance system.

## Customer Benefits

- Lower initial investment
- Low maintenance cost
- No need of oil for governor operation, eliminates the periodic attention of oil change and maintenance of governor
- No hunting of engine (accurate, precise, repeatable controls)
- Extensive fault diagnostics features
- Easy break down maintenance
- Increased reliability of locomotive
- Extended warranty and unit exchange options
- Eliminates the booster pump for cranking, which saves the cost and maintenance.
- Substantial reduction of thick black smoke and lesser fuel oil consumption



## Operational Features

- Universal Control unit to suit different engine makes and models
- Light weight Actuator < 30 kgs
- Control Unit with inbuilt display
- Dry run test for checking fuel rack movement
- Driver display information includes Notch, Engine speed, Fuel Rack position, Lube oil pressure, Fuel oil pressure, Boost Air pressure, Water pressure and Load control position.
- In-built engine safety features (low lube oil shutdown, over speed shutdown, low water pressure protection etc.)
- Maintenance free solution to replace high maintenance mechanical type engine governors.
- Notch-wise diesel engine run-time counters to calculate the load factor.
- Tuning of governor is digital through LAPTOP/PC against the manual adjustment on trial and error methods in mechanical governor.
- User settable governor parameters through LAPTOP/PC like Notch-wise engine RPM, Notch-wise fuel rack, Manifold air pressure based fuel rack limits, over speed trip settings etc....
- User settable of Lube oil pressure & Water pressure shutdown limits at each Notch through LAPTOP/PC.

# Technical Specifications

## Governor Actuator unit

- Working capacity >16 NM.
- Weight < 30kgs.
- Rack movement Linear output from 0 to 30mm for ALCO & GE Locomotives.
- Rack movement Rotary output from 0 to 30 degrees for EMD Locomotives

## Control unit

- Operates on 72volts DC Locomotive battery supply.
- 16 bit Micro-controller based unit running at 80MHz or higher clock frequency.
- Universal Control unit for all type of Locomotives
- Interface with all type of Loco control system.
- Compact size (L-280/ W-125/ H-262) & Less Weight < 5kgs.

## Pressure sensors unit

Pressure sensors unit comprises three pressure sensors, lube oil pressure sensor, fuel oil pressure sensor, Boost Air pressure sensor.

### Lube oil pressure sensor

- Measures the engine lube oil pressure 0 to 10 bar
- Sensor working supply voltage 12 to 30 volts DC
- 2-wire current output 4 to 20mA

### Fuel oil pressure sensor

- Measures the fuel oil pressure 0 to 7 bar
- Sensor working supply voltage 12 to 30 volts DC
- 2-wire current output 4 to 20 mA

### Boost Air pressure sensor

- Measures the Boost Air pressure 0 to 3.5 bar
- Sensor working supply voltage 12 to 30 volts DC
- 2-wire current output 4 to 20 mA

## Engine speed sensor

- Measures the Engine RPM 50 to 2000 RPM

## Engine water pressure\*

- Measures the engine water pressure 0 to 5 bar.
- Sensor working supply voltage 12 to 30 volts DC.
- 2wire current output 4 to 20mA

## Exhaust gas temperature sensor\*

- Measures the Temperature 0 to 600 degrees
- PT 100 type

\* Optional items, shall be purchased separately.

Alco 251 series engines



EMD 567, 645 and 710 engines



GE 7FDL engines



Indonesia, Tanzania, Zambia, Brazil, Malaysia, Sri Lanka, India, Bangladesh, Myanmar, Mozambique ...

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