

Comparison between Econrg Sequential Injection Dual Fuel System & Conventional Gas Train System		
Particulars	Econrg Sequential Injection	Conventional Gas Train
1) Gas Pressure	Operates on pressure from 0.3 bar to 2 bar	Requires minimum Gas Pressure of 1 bar
2) Gas Injection	<p>Fully Controlled by Electronic Control Unit (ECU) using Gas Injectors with 100% Precise Fuel Injection as per requirement of Genset.</p> <p>This ensures highest replacement, optimum air fuel ratio and precise gas metering for optimum combustion.</p>	<p>Uses Mixer technology for Gas Injection which lacks precision and cannot adjust as per varied load.</p> <p>This has an impact on fuel consumption, imbalanced air fuel ratio which can lead to overheating and excessive exhaust temperature.</p>
3) Safety Features	<p>Ensures highest safety for genset engine as well as dual fuel system.</p> <ol style="list-style-type: none"> 1) LSU 4.9 Lambda Sensor- Gives accurate information on Air Fuel Ratio and ensures precise fuel injection and combustion. Completely eliminates error and achieves optimum combustion. 2) Knock Sensor- Completely avoids abnormal combustion activity in cylinder head and safeguards engine from failure due to irregular knocking. 3) Exhaust Gas Temperature Sensor- Gives inputs on exhaust temperature and ensures that Diesel genset does not continue to operate on high exhaust temperature. 4) PS 04 Pressure Sensor- All in one built pressure sensor gives us accurate values of pressure from the pipeline, manifold absolute pressure and 	<p>Limited Safety features-</p> <ol style="list-style-type: none"> 1) Vibration Sensor- It works similar to knock sensor but lacks accuracy since it gives inputs on vibrations and not the accurate combustion activity in cylinder head. Cannot detect abnormal combustion if it occurs precisely. 2) Exhaust Gas Temperature Sensor- Works similar 3) Pressure Sensor- It provides information on gas pipeline pressure and manifold pressure but does not contribute in fuel injection since fuel injection is controlled mechanically and not electronically. <p>This system Lacks – LSU 4.9 Lambda Sensor which is extremely important for accurate air fuel ratio and also reduction of emission.</p> <p>Cases of failure can happen especially damage to piston or cylinder head is a common phenomenon in this technology. Example- Mahle in NCR have faced this issue and removed the system.</p>

	<p>gives real time signal to fuel injectors for precise opening and closing.</p> <p>Zero chance of engine failure since the ECU is calibrated in a method which is suitable for Genset and operates only within permissible parameters. In case of abnormal signals, Dual Fuel system auto adapts and ensures operation on Diesel until the abnormal activity is corrected. Practically not possible to damage engine components.</p>	
4) Space requirement	<p>Extremely compact, installs within the Genset Canopy, comes with a Digital PLC that displays following inputs realtime-</p> <ol style="list-style-type: none"> 1) Gas Injection Timing 2) Air Fuel Ratio 3) Knock Sensor values 4) Exhaust Gas Temp. Values 5) MAP Values 6) Gas Pressure 7) Engine RPM 8) Battery Power Supply 9) ECU Internal Temperature 	<p>Needs excessive space due to large piping, complex structure and have limited inputs to the PLC.</p> <ol style="list-style-type: none"> 1) Exhaust Temperature 2) Vibration Reading 3) Battery Voltage
5) Engine Operation	<p>Since the fuel injection is inline with the requirement of engine due to real time inputs, operation becomes smooth and has a positive impact on efficiency and power.</p>	<p>Fuel Injection is mechanically done and has a negative impact on engine power, efficiency as the fuel supplied may not be in line with the requirement of engine as it depends on variable load.</p>
6) Operating Capability	<p>Econrg Dual Fuel System operates even on 110% Load on Dual Fuel in the same precise manner in which it may operate on 50% or 75% Load. Replacement ratio and engine performance at par with Diesel.</p> <p>NO DERATING</p>	<p>Gas Train cannot operate on Dual Fuel Mode at 100% Load. It can only operate up till 75% Load on Dual Fuel and shifts to Diesel on 100% Load.</p> <p>Replacement ratio cannot be achieved higher since it fuel supply is set at one particular load and cannot adjust depending upon changing load condition,</p>

1.1

ECONRG Gas Controller 250 KVA



- EcoNrg Diesel is an alternative fuel system for Diesel engines that feature 2 to 16 cylinders.
- The whole fuel gas system is based on technical solutions for supplying fuel with air, which is mixed in the cylinders with Diesel fuel.
- EcoNrg Diesel supports switching to the Diesel fuel supply since the solution does not modify the engine internals.

1.2 Exhaust Temperature Sensor



- Exhaust Gas Temperature Sensors (EGTS) measure the temperature in the exhaust system and communicate it to the GENSET's ECU.
- They also help protect high-quality components such as turbos, catalytic converters, and diesel particulate filters in the hot exhaust tract and create cleaner emissions.

1.3 Knock Sensor



- The knock sensor identifies the high-frequency engine vibrations characteristic of knocking and transmits a signal to the ECU.
- The aim is to obtain the maximum energy yield by starting ignition as early as possible.
- Engines with a knock sensor can reduce fuel consumption and increase torque.

1.4 Controller Harness



- An original set of electronics connection harnesses, for the gas installation of the fourth generation of sequential injection in the volatile phase.
- Complete bundles with original plugs and sockets, version for the pressure sensor.

1.5 Temperature & Pressure Sensor



- A device that measures gas pressure, manifold vacuum, and gastemperature in the gas path. 3-in-1- measures pressure, vacuum, and gas temperature.
- Designed for C gas injection systems in all genset regardless of engine power, including turbocharged ones.
- Measurement of gas pressure, manifold vacuum, and gastemperature in the gas path.
- A large number of mounting configurations.
- The low inertia of response to a change in gas temperature

1.6 Switch LED-600 AC



- Digital Diesel/gas (P/G) switch. The main element for the Operator's communication with the gas controller is used to switch engine fuel types.
- Selection of the fuel type.
- Gas level indication with 4 green LEDs.
- Low fuel level indication with 1 red LED.
- Optical and acoustic signals.
- Adjustable buzzer volume.
- Optional emergency engine starts on gas fuel.

1.7 Lambda sensor



- Optimized engine combustion and improve engine efficiency.
- The Lamda/oxygen sensor with Genset- specific connector supports the ECU in the measurement of the air-fuel mixture.

1.8 Solenoid valve



- Internal Parts are in superior corrosion resistance steel,
- High Reliability Unaffected by Voltage Surges.
- Epoxy square coil, Metallic round enclosure, IP-67 Flameproof enclosure, IP-68 Weatherproof enclosure.
- A special high flow rate is available on request at low-pressure or gravity-pressure applications.

1.9 5 mm & 12 mm Rubber Pipe



- This premium quality multi-purpose hose is fully compliant with the international standards & specifications for gas and fuel hose and is suitable for the conveyance of petroleum products with up to 50% aromatic content.
- Rubber NBR material is specially designed for automotive and engine applications.
- The hose is suitable for petrol, diesel, ethanol, gasoline and is very flexible for easy routing.
- The smooth outer is resistant to oils and fuels, heat, ozone and weather.

1.10 Injector rail



- The STAG AC W01 BFC gas injector is intended for PNG, LPG, CNG Fuel systems and all engine types, including turbocharged engines. The gas injector provides superior performance and a fully unified compatibility with other AC products.
- Heatsink-encased coil
- Simple and lightweight casing
- Stable performance in varying ambient conditions, including temperature and pressure

1.12 Temperature sensor



- The Coolant Temperature Sensor is used to measure the temperature of the engine coolant.
- The readings from this sensor are then fed back to the engine control unit (ECU).
- This data from the sensor is then used to adjust the fuel injection and ignition timing.

1.13 Gas Filter



- CNG enters the body from the inlet of the filter and filters the impurity in the gas through internal filtering.
- Clean gas comes out from the other end, it is an important piece of equipment in the distribution system.
- Special filters for automobile gas can prevent dust and dirt from entering the injection rail and engine with natural gas thereby protecting the injection rail and engine.
- It is an effective protection for automobile performance and accessories.