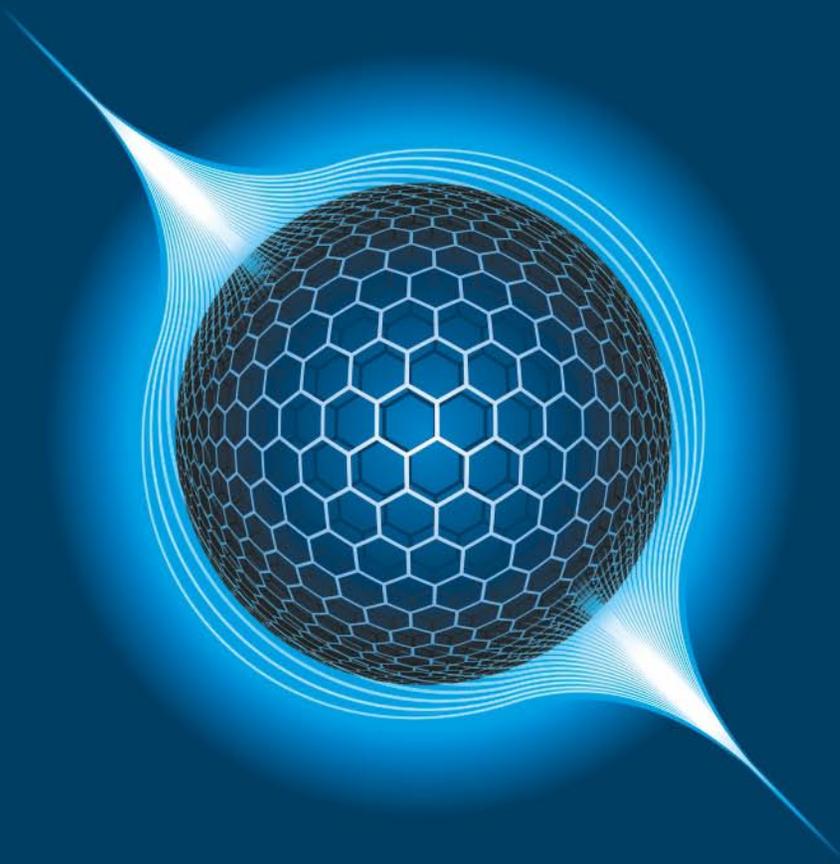


# BI-FUEL (DUAL FUEL) CONVERSION OF DIESEL GENERATING SETS



**iFusion**  
GOOD FOR THE ENVIRONMENT

Breathe cleaner air  
and take care of the planet.





**“Diesel Power Engineers is a dynamic company with a solid reputation for delivering innovative solutions to the power generation electronics market. By providing customers with state-of-the-art products, Diesel Power Engineers has built a name for delivering excellent reliability and good value.”**

**Arun Saini**  
**Managing Director**



Diesel Power Engineers was founded in 1991 in India. Since then Diesel Power Engineers has specialized in gen-set electronics developing several lines of gen-set control systems, anti-knocking detectors, misfiring detectors, gas injection controllers, engine management systems etc.

Diesel Power Engineers to serve customers throughout the world delivering products that offer a proven and reliable solution.

Within the last decade Diesel Power Engineers has become recognized as the leader in many of its core areas and is now the largest supplier of turn-key bi-fuel solutions and bi-fuel conversion components.

Diesel Power Engineers key advantage is our flexibility, experience, knowledge and enthusiasm in all of our three product lines:

- Electronic products for the power generation industry
- Turn key electronic and electric solutions for power generation industry
- Bi-fuel conversion solutions

The managements task is to keep and strengthen this advantage by helping our customers solve their problems and in doing so keep our customers fully satisfied with excellent service.

Within our company we work towards establishing a pleasant and friendly atmosphere designed to support the creativeness, dynamics and courage in finding new opportunities, projects, solutions and technologies. We will always deal honestly and fairly with our partners and personnel.

# High Speed Engine Conversion System

## HOW IT WORKS

Gas is mixed with air by a common mixer installed before the turbocharger(s). Gas flow is controlled by a throttle valve, which is electronically operated by the iFusion control system according to the required engine output and speed.

In order to avoid knocking of the engine, iFusion knocking detector/controller is installed, thus enabling engine operation at the most efficient gas/diesel ratio.

System for conversion of industrial diesel engines to bi-fuel operation by substitution of typically 50–80% natural gas for diesel.

- Suitable for all High Speed Engines, 1200–1800 RPM
- No reduction of engine power or efficiency
- Smooth transition between diesel and bi-fuel operations at any time
- Gas and air are blended behind air filter before turbocharger by central mixer
- State of the art electronics maximizes the amount of injected gas while keeping all engine parameters within limits specified by the engine manufacturer
- No modifications of internal engine components are required

## BASIC SCHEME OF THE CONVERTED ENGINE



## MAIN FEATURES

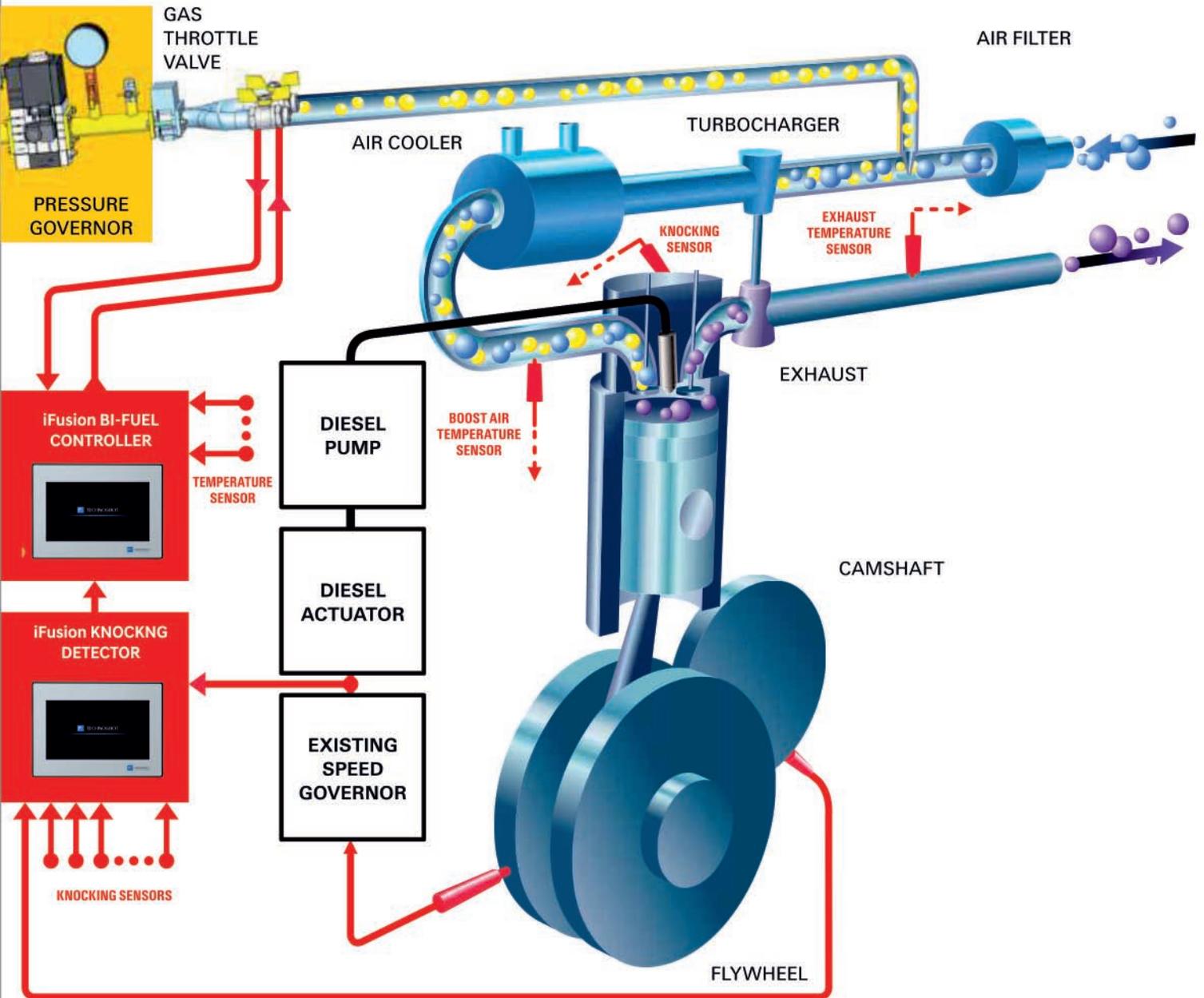
- Completely automatic system
- Cheaper electricity production
- Non-derated output power
- The same response to load steps
- The amount of gas is maximized as much as possible under varying conditions at any time
- High stability and increased protection of the engine
- Lower emissions
- Possibility of pure diesel operation maintained
- Prolonged service intervals
- Turn-key solution
- Easy operation

## TYPICAL CONVERTIBLE ENGINES

- High-speed (1200 – 1800 rpm)

## MAIN FEATURES

- Air / gas mixer(s)
- Gas throttle valve with actuator
- iFusion bi-fuel controller/governor
- iFusion knocking detector/controller
- Sensors (acoustic, pressure, temperature, etc.)
- Gas train (gas manifold, gas governor, double closing valve, filter, ball valve etc.)



Actuator



Gas Throttle Valve



Vibration Sensor



Thermocouple



Gas / Air Blender

# What is and why bi-fuel (dual fuel) conversion?

## ECONOMIZE ON THE COST of your power generation by converting your diesel generating sets to BI-FUEL OPERATION

iFusion simple bi-fuel conversion modifies your original diesel engine so that it uses natural gas as the main fuel – substantially reducing operating costs.

It works by introducing gas to the engine via various technologies and then electronically controlling flow dependent on engine speed and output.

bi-fuel conversion requires virtually no engine modification and brings double benefits in every application:

- Affordable diesel engines combined with inexpensive natural gas
- Economic solution for slow-speed, middle-speed and high-speed engines
- Flexible use of fuel
- Guaranteed power output
- Efficient and safe operation with lower emissions
- Longer engine life and reduced maintenance costs makes it the perfect investment

### Conversion of Diesel Engines to Bi-Fuel.

#### Solutions available for:

- high speed engines
- slow and middle speed engines



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GOOD FOR THE ENVIRONMENT



## Bi-Fuel? Make BIG savings on your fuel costs!

### COMMON FEATURES

- Substantial savings on operation cost
- Practically no engine modification required
- Non-derated output power
- Possibility of original diesel operation at any time
- Safe and secure operation
- Lower emissions
- Longer engine life span
- Prolonged service and maintenance intervals



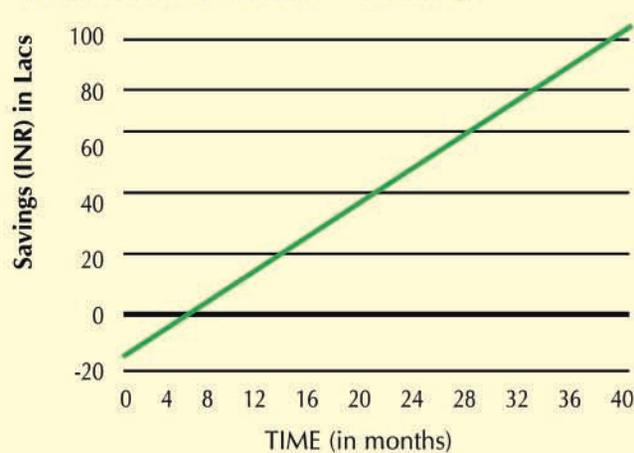
The flow of gas is controlled by a gas control valve, through a robust industrial PLC. If the following parameters exceed the set limits, the PLC will give command to the gas control valve to reduce the flow of gas:

- **Vibration to high**
- **High or low engine load**
- **Frequency out low engine load**
- **Exhaust gas temperature too high**

The PLC will disable the gas flow by de-energizing the gas lock-off solenoid under the following conditions:

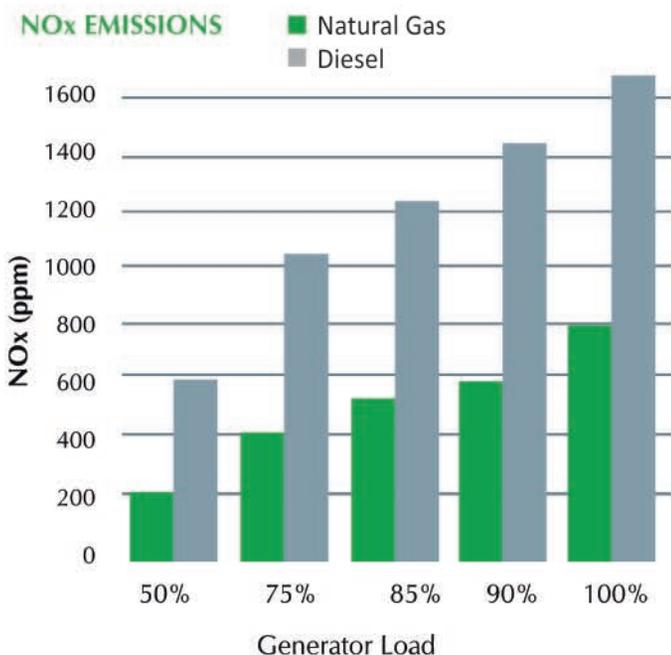
- **Emergency Stop switch is open**
- **Low or High load limit exceeded**
- **Gas Control Valve OK relay is open**
- **iFusion System Enable switch is open**

### TYPICAL SAVINGS / ROI

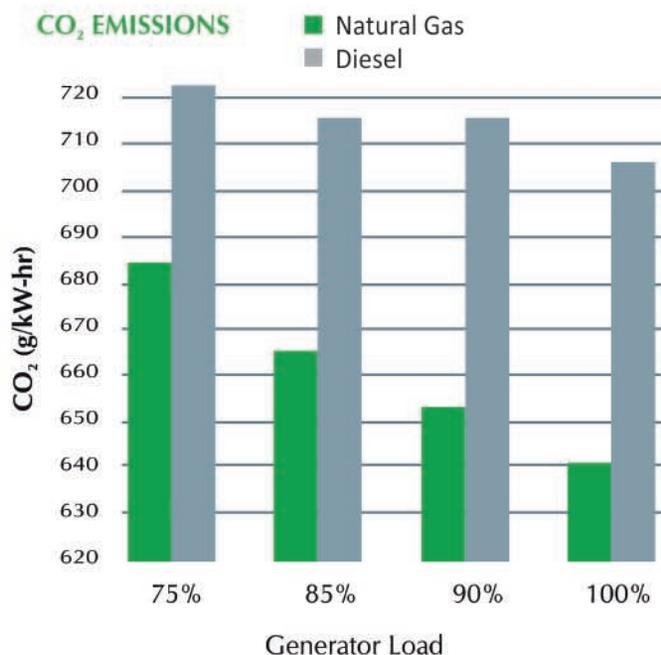


1000 KW DG set, 80% engine load, 8 hrs/day running time, ₹89/- ltr diesel cost and ₹49/m<sup>3</sup> NG cost

### NO<sub>x</sub> EMISSIONS



### CO<sub>2</sub> EMISSIONS



(For 500 KVA Cummins, K-19 engine model)

# **DIESEL POWER ENGINEERS**

55, SANJAY ENCLAVE, OPP. G.T.K. DEPOT, DELHI-110033

E : [info@ifusion.org.in](mailto:info@ifusion.org.in) | M : +91 9311141067, 9810046087 | [www.ifusion.org.in](http://www.ifusion.org.in)