



HUEGLI TECH AG (LTD)

The Engine & Genset Control Company

Gas engine Management

75 Years

consulting

engineering

prototyping

customised solutions

worldwide support

training

*Solutions for combustion engines,
that work right from the beginning.*

Huegli Tech AG (Ltd)
The solution provider

**Complete Control
Systems for Gas
Engines**



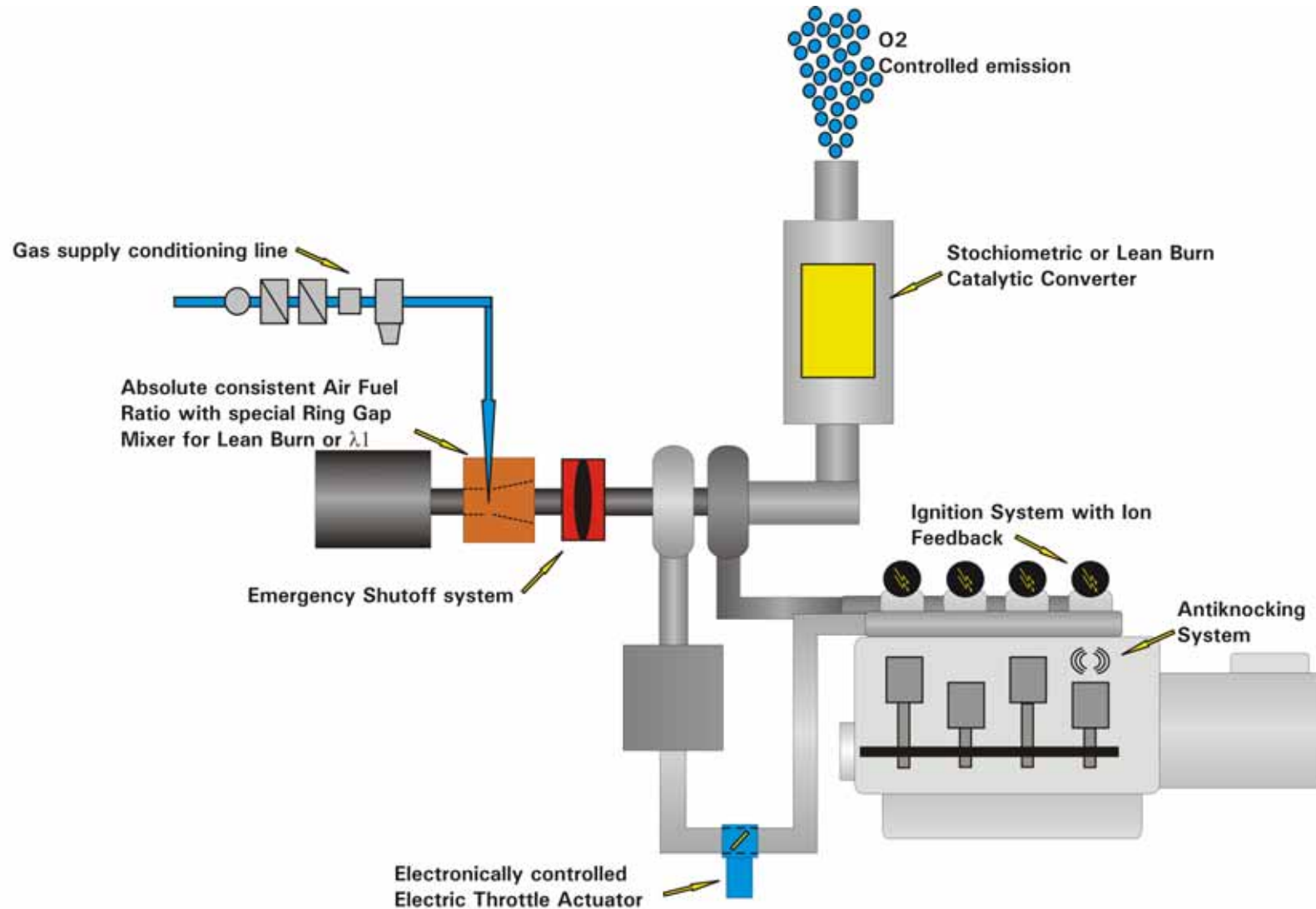
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Gas engine optimisation using unique systems





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One source for best performance and cleanest possible Emission

HUEGLI TECH offers all the heart beating components for a gas engine. No matter if Natural, Bio or other gases.

It is important, to have components which are capable to withstand the harsh environment in the field but also have the ability to communicate via CAN among each other.

Long experience, paired with extensive evaluation result in a comprehensive gasengine management system incorporating:

- Unique Air/Fuel ratio control
- Air/Gas mixing device
- Engine and Gen-set automation module
- Electronic speed control
- Ignition system
- Engine Protection
- Catalytic converter

All key components are linked via CAN Bus to maintain optimised operation under all conditions, also for remote control and status communication.

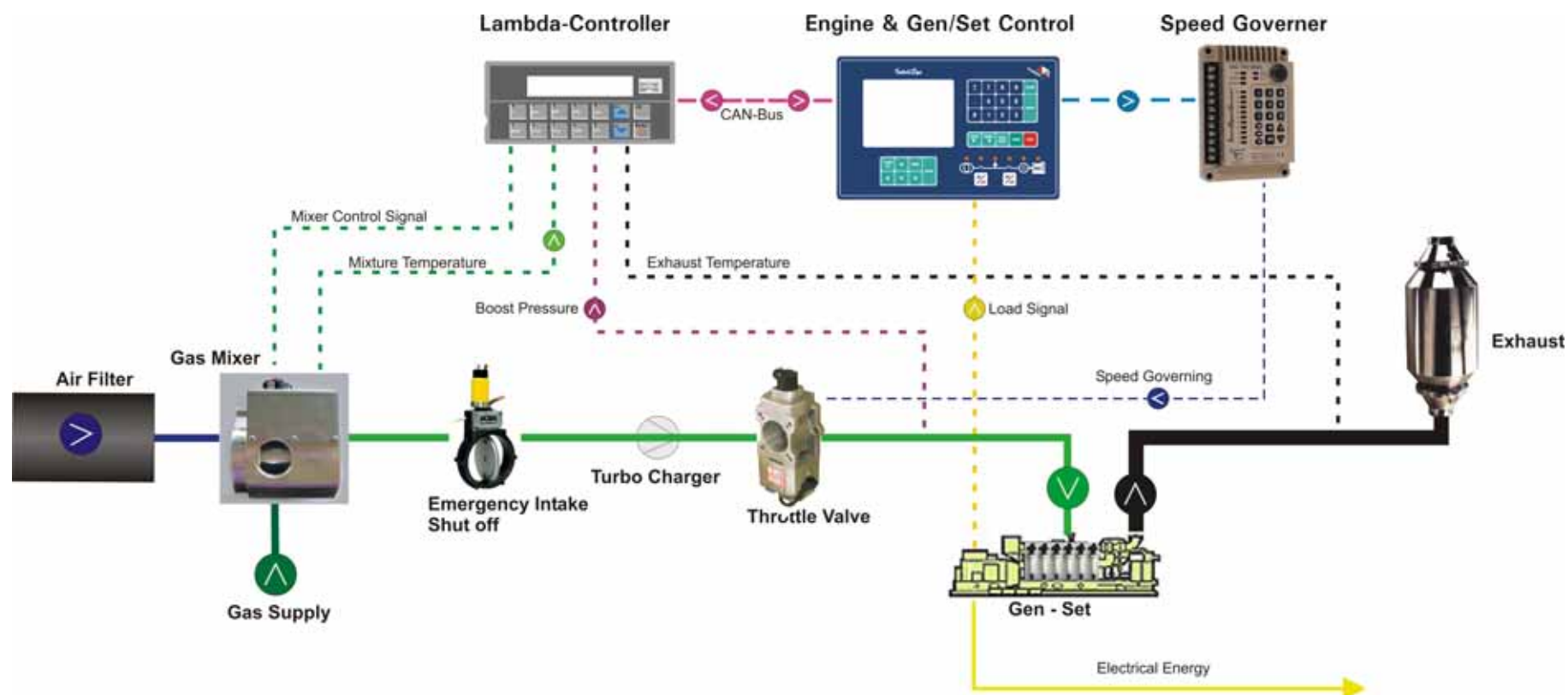


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The optimised Gas engine Management System



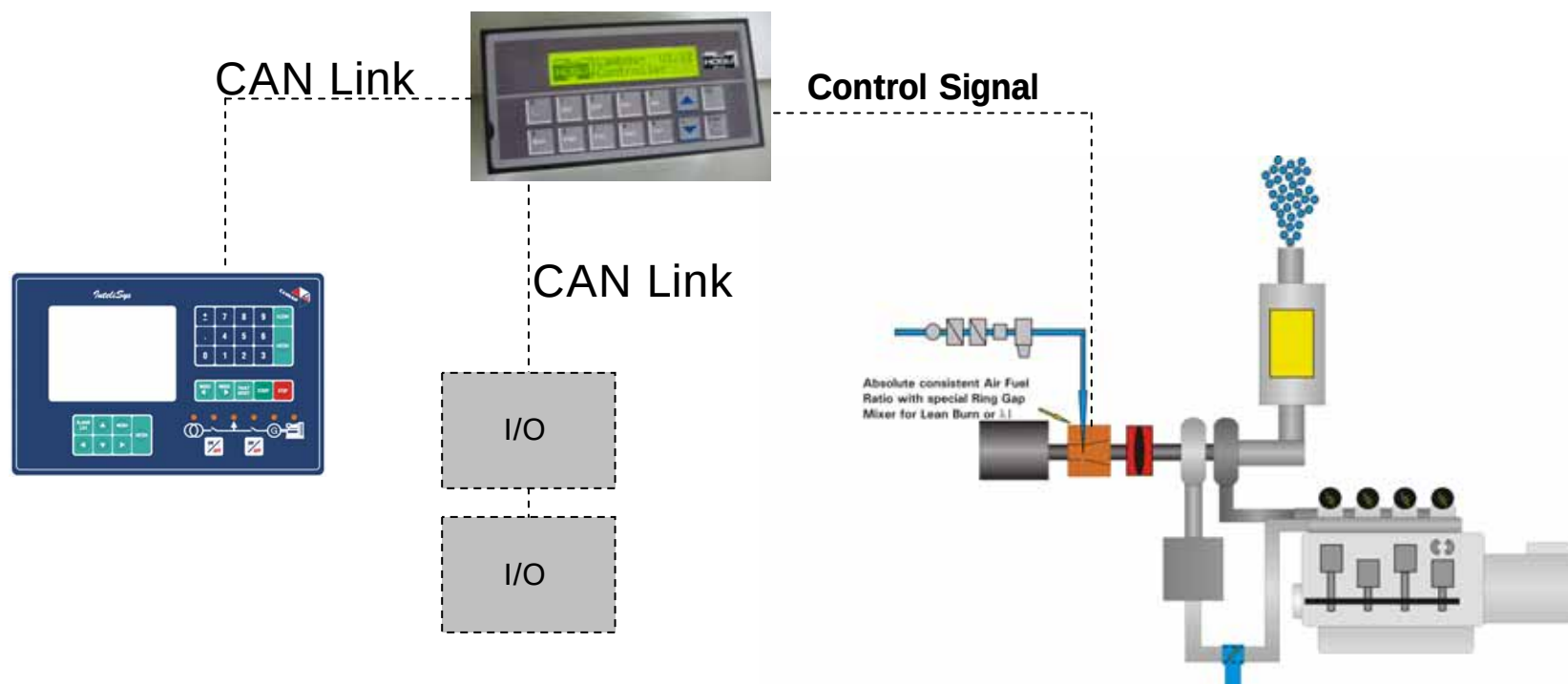


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Lambda Controller





Lambda Controller

Unlike most other systems, this unique concept needs **no O₂** sensor, that can contaminate and then drift, resulting in undesirable lambda values.

This Lambda Controller with display, constantly measures load (kW), manifold pressure and temperature, Exhaust temperature and other parameters, and signals the special Ring gap Mixer to maintain a consistently very accurate lambda value.

The controller also incorporates many configurable I/O's making costly extension modules superfluous.

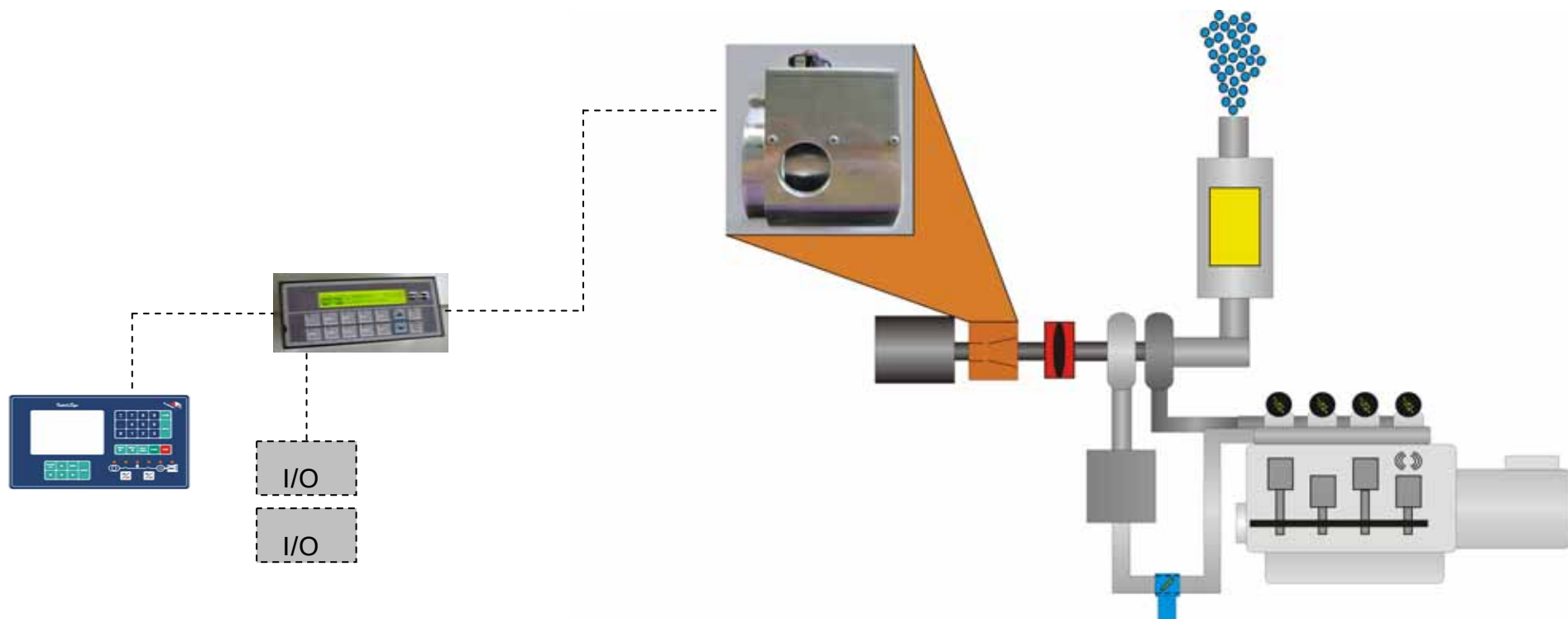


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Ring Gap Air Gas Mixer



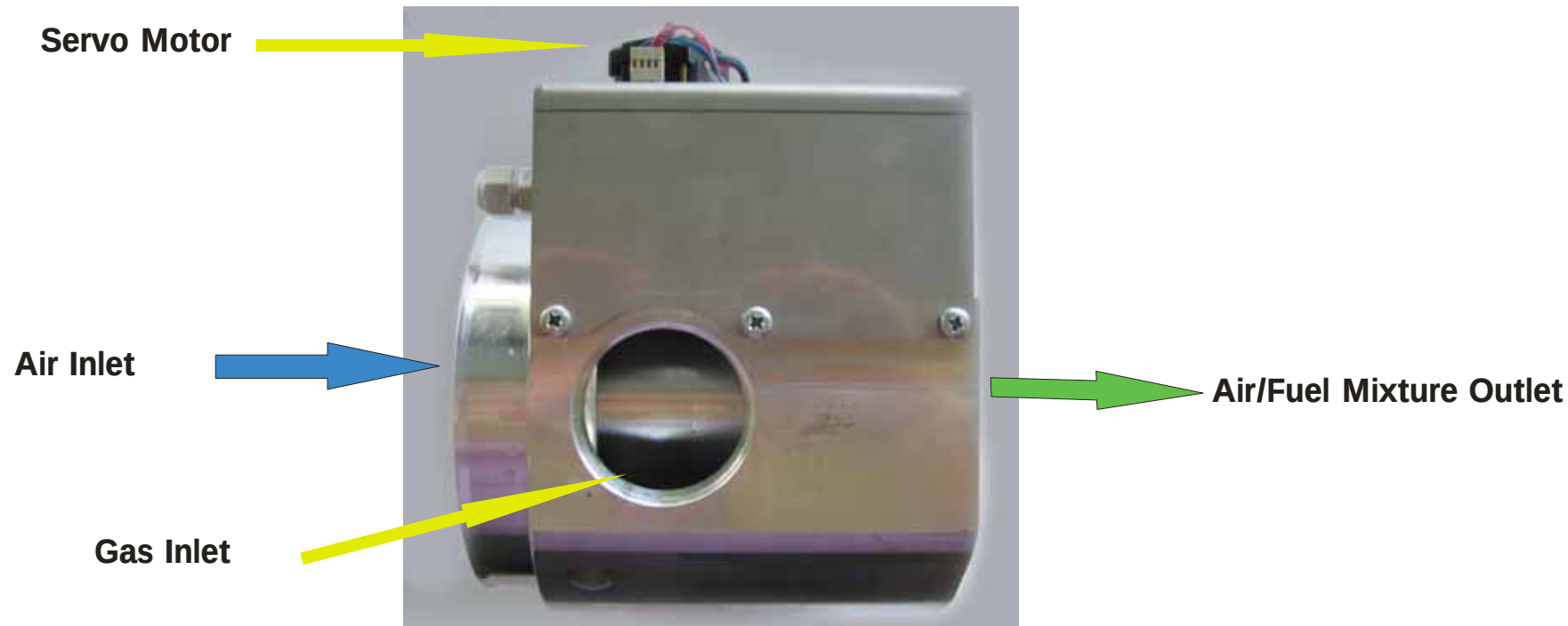


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Ring Gap Air Gas Mixer

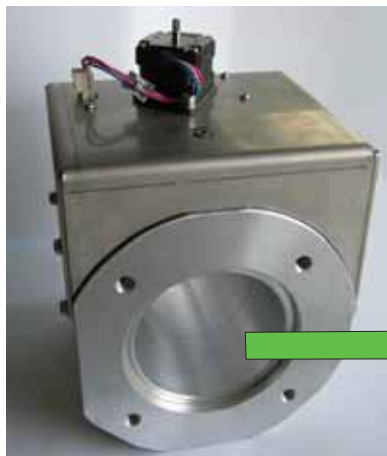




Ring Gap Air Gas Mixer



Air Inlet



Mixture Outlet

- This unique Air/Gas Mixer is a fully dynamically, closed loop operating device.
- It is available for engines up to 25 liters displacement.
- The mixer is based on a ring gap principle which allows to meter the gas very accurately via a metering bushing actuated by a Servo motor with position feedback. The Servo motor is controlled by the Lambda controller 0-10VDC/4-20m Amp.
- Additional mounting holes on the mixer are provided for pressure sensors, such as air filter vacuum, gas pressure and crank case ventilation.

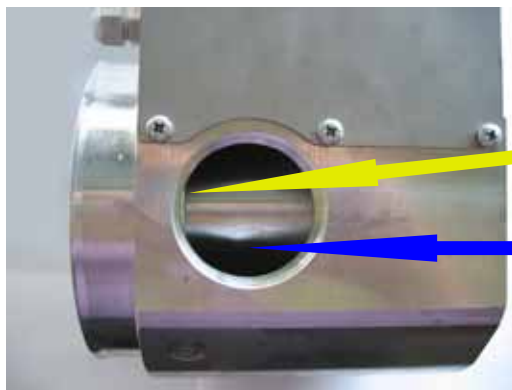


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Ring Gap Air Gas Mixer



Narrow Gap: Less Gas

Metering Bushing



Large Gap: More Gas

The amount of gas flowing into the mixer is precisely determined by the moving metering bushing.

When the lambda controller calls for more gas, the servo motor will instantly position the metering bushing for a wider gap, and vice versa if less gas is needed.

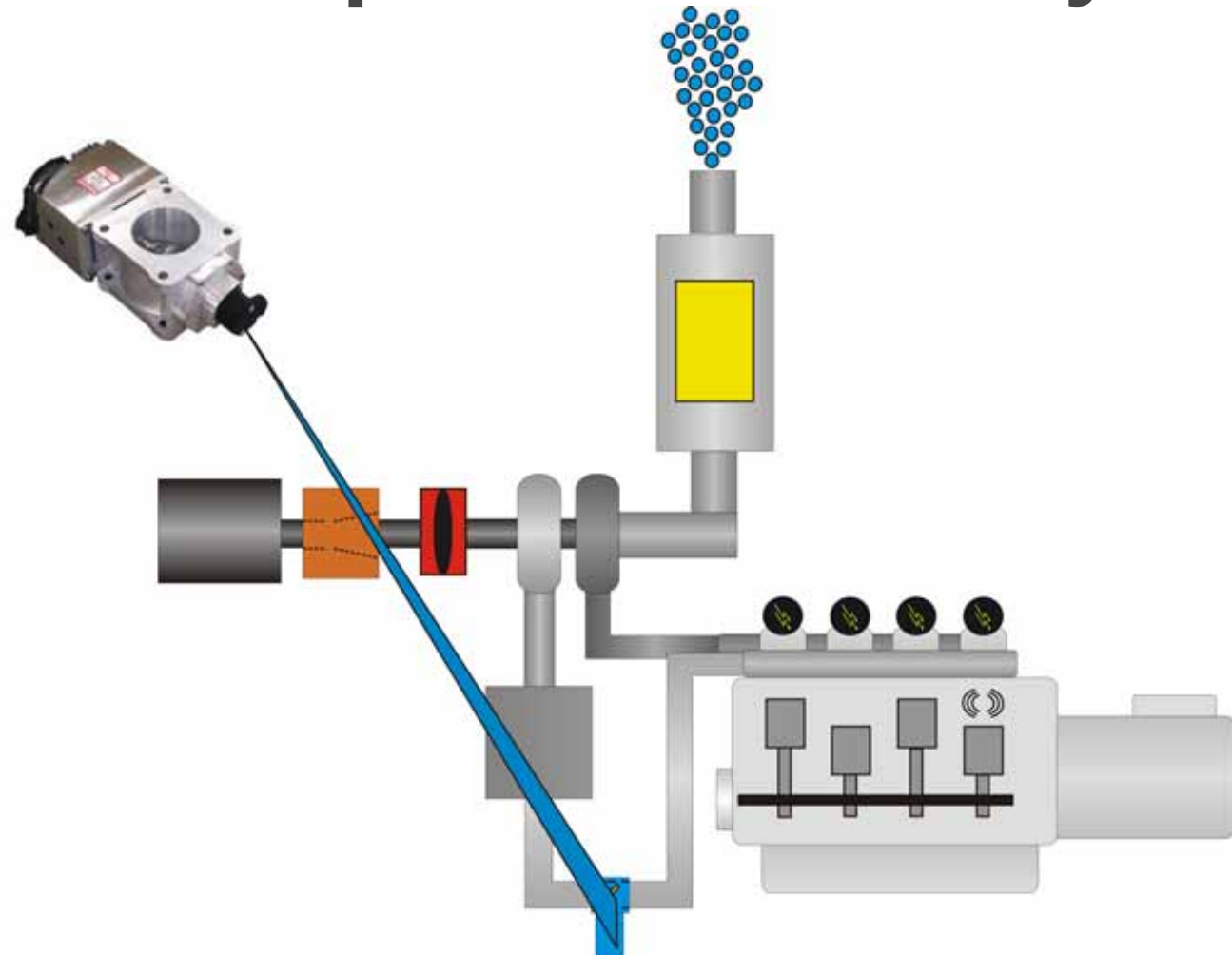


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The Electronic Speed Control System





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The Electronic Speed Control System

A vital part of the entire gasengine management is the speed control portion. It consists of long time world wide proven ATB electric actuators matched with either analogue or digital control units.

ATB Actuator Family



- Rugged direct manifold mount
- Fast response, spring return
- High temperature resistant
- Maintenance free
- Optional Position Sensor

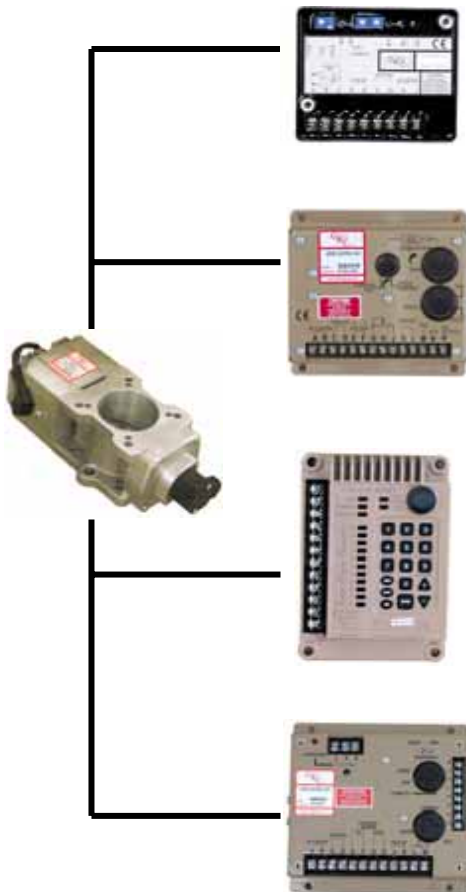


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The Electronic Speed Control System



ESD 2401 Economical Control

For Single engine applications

ESD 5525E Universal Control

For Single and Parallel operation

SDG 735

Microprocessor based control Single and Paralleloperation.

ESD 5403

For Single and Parallel operation including Position Feedback Input



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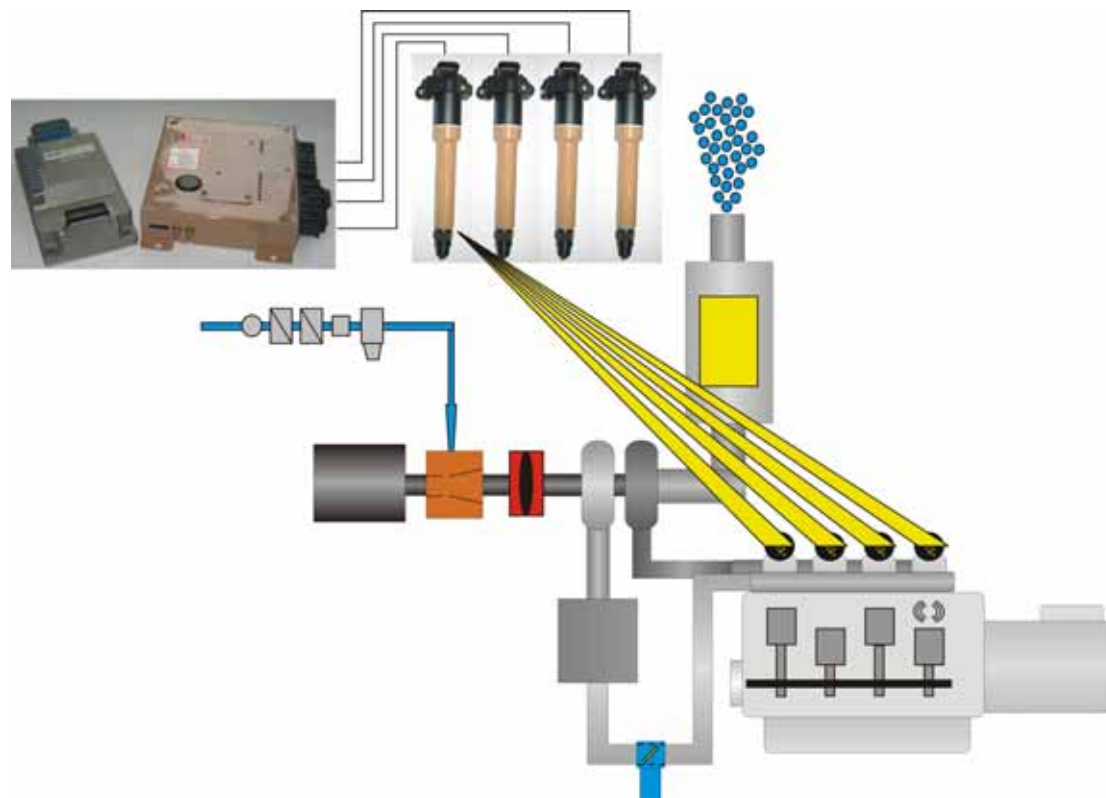
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Ignition, Misfiring and Knocking Control

A new Ignition system for industrial engines is being finalised.

It is based on field proven components using ION feedback technology for detection and prevention of misfiring and knocking.

Spark energy and spark duration are configured for optimised ignition of the mixture, yet simultaneously reducing the wear of the spark plug for longer life.





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Ignition System with Accessoires



Master and Driver module communicate via CAN Bus.

Integrated coil connectors are adapted to existing cylinder cavities.

High Tension cables are superfluous.



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Ignition System – The Coil with integrated connector



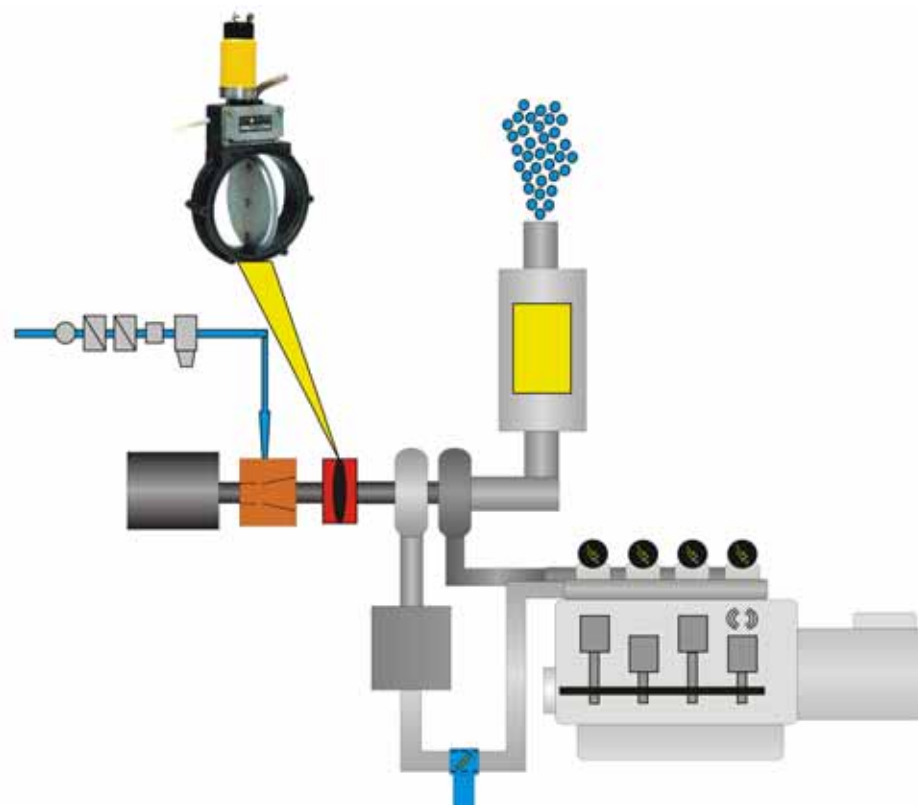
← Ignition Coil with Ion Feedback

← Exchangeable Spark Plug Connector

The special internal design of this field proven coil provides the consistent spark characteristic for optimised combustion. The integral connector avoids external cumbersome high tension leads.

Emergency Shut Off - Safety

To avoid uncontrolled situations when operating in hazardous areas with combustable vapours or dust, this emergency stop system will automatically shut off the intake air/fuel mixture in case of an overspeed tendency.





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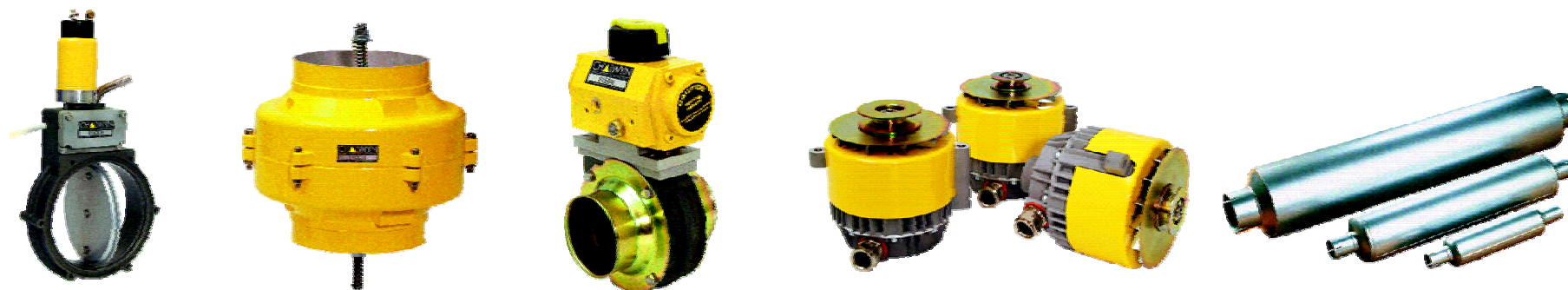
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The safety shut off valves

A variety of valve versions are available. The range includes completely self contained automatically closing valves, but also electrically, pneumatically or hydraulically controlled valves, in various sizes.

Manual override is possible with all valve types.

For extended safety, flame proof alternators and spark arrestors are available.



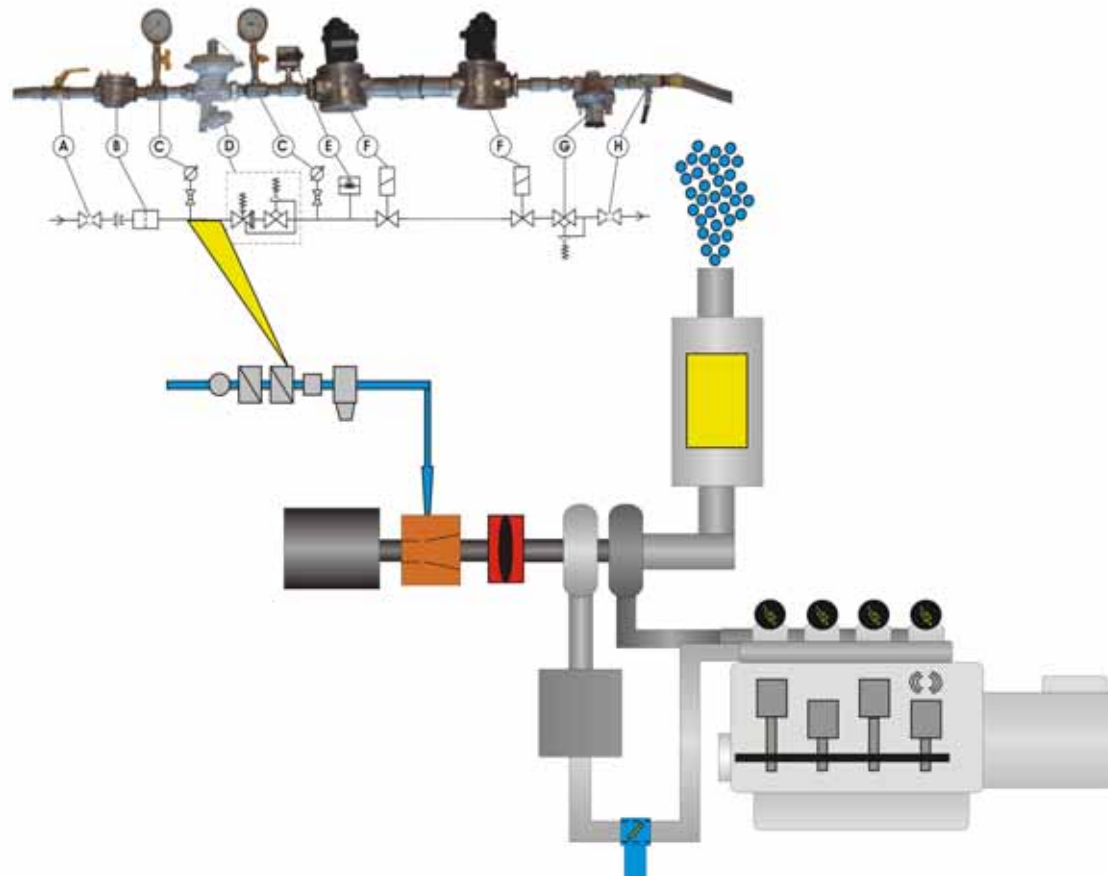


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Gas Street and Components

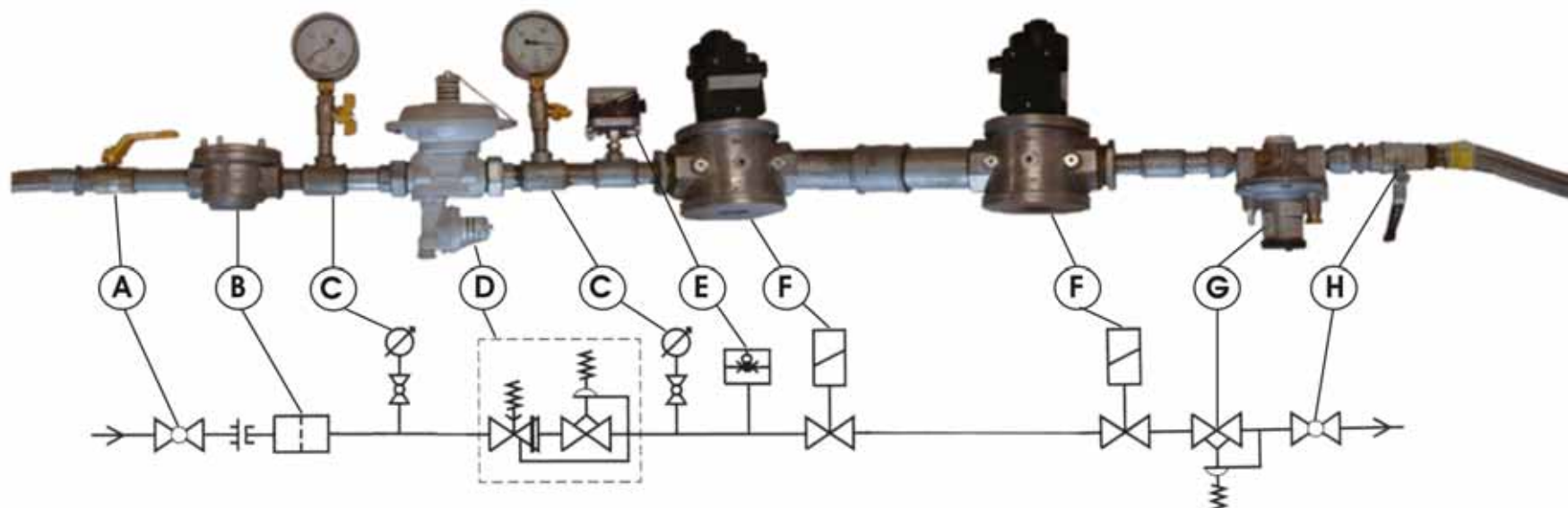




Gas Street and Components

Considerations:

Wherever gaseous fuels are utilised, the safety aspects have highest priority. It is therefore important that only components of proven quality are used. For stable engine operation under various load and temperature conditions, it is important that the gas supply pressure does not fluctuate, and that the gas itself is free of contamination. In order to provide reliably consistent gas pressure to the engine air/fuel mixing system, we have selected, as an option, approved high quality filters and pressure regulating devices, mainly from “Krom Schröder”, which will also function with gases with higher humidity, and conform to European safety standards.



Pos. A,H	:	Manual ball valves for manual shut off of the gas supply
Pos. B	:	Gas filter for filtering out contamination.
Pos. C	:	Pressure gauges, with a manual shut off valve, allow to measure the gas pressure before, and after the first pressure regulator, pos. D.
Pos. D	:	Particular first stage regulator accepts inlet pressures up to 1 bar and reduces the outlet pressure to 50mbar
Pos. E	:	Pressure switch monitors the presence of correct gas pressure and signals loss of gas pressure.
Pos. F	:	Safety regulations request two solenoid gas valves to protect against failures in the operating systems.
Pos. G	:	"Zero" pressure regulator maintains a constant gas pressure, adjustable between 0.5 to 100mbar



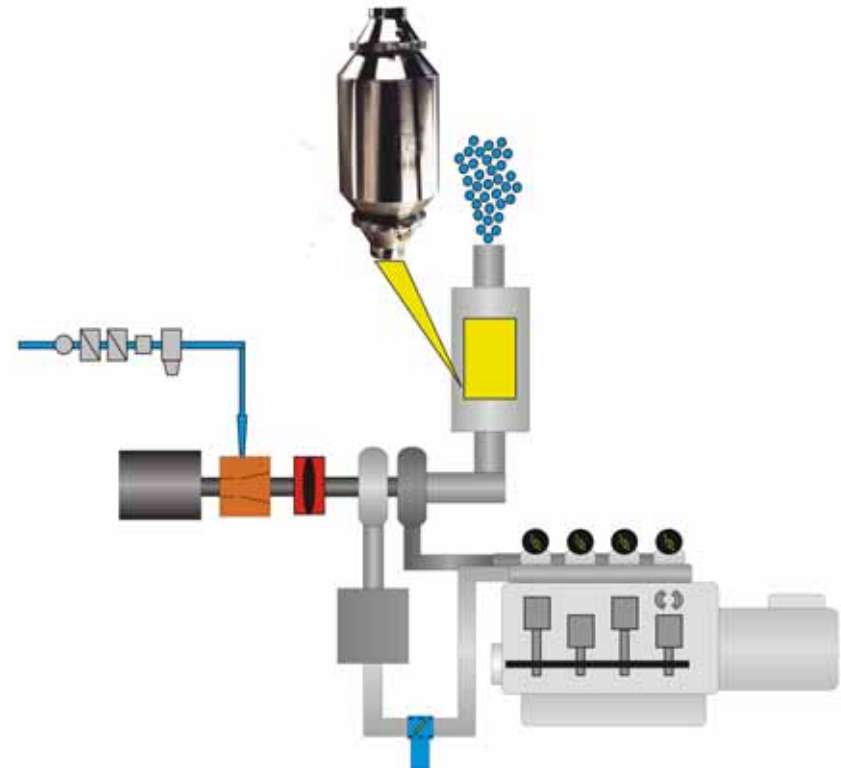
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Catalytic Converter

A catalytic converter is made mainly of a muffler like chamber, which contains porous, heat-resistant materials coated with either platinum or palladium. These materials are known as catalysts. The catalyst will force the exhaust gases to start a chemical reaction, without the catalyst being exposed to wear.





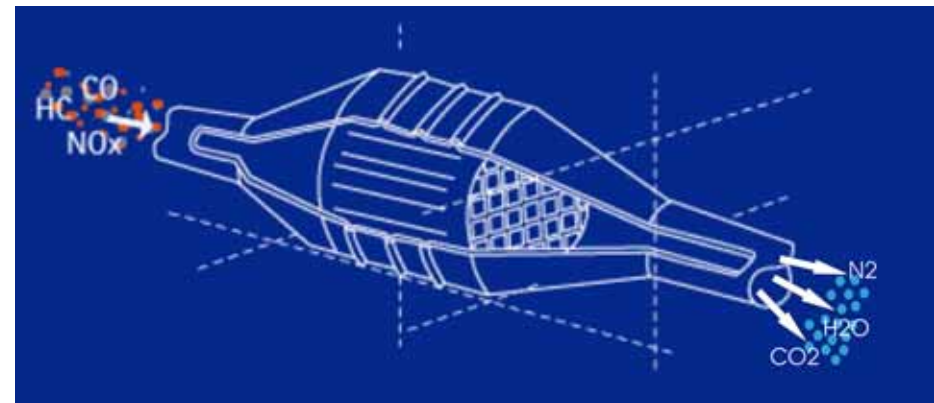
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Catalytic Converter

The idea behind a catalytic converter is that the carbon monoxide gas and hydrocarbons emitted from the engine will travel along the exhaust system until they reach the catalytic converter precious metals. Once the exhaust gases get in to contact with the catalyst, it forces a chemical reaction between the carbon monoxide and hydrocarbons with the oxygen inside the converter, creating products of carbon dioxide and water vapour.





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Catalytic Converter

- **HUEGLI TECH** offers a wide range of catalytic converters, adapted to specific applications on gas engines:
 - Oxidation catalyst
 - 2 – way catalyst
 - 3 – way catalyst (Lambda 1,0)
 - SCR Selective Catalytic Reduction (lean burn, Lambda 1,3)
 - In various configurations to suit engines from 50 kW to 5000 kW and more

Sizing, installation and service are integrated into our core business worldwide!

- **HUEGLI TECH** also offers emission systems for diesel engines, such as particulate oxidation catalysts, PM filters and catalytic converters.



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Summary

A Gas engine Management
that works from beginning:



Air / Fuel Ratio Control



Mixer



Governor and Actuator



Ignition



Protection



Gas Street



Catalytic Converter