

Technologies

elco





Why choose the elco technologies?

elco always looks for the best technologies and develops new ones to:

Simplify your work:

the AGP® and GEM® systems reduce the commissioning time, the RTC® and MDE® systems simplify maintenance and service.

Improve the running of your installations:

RHP® and FGV® systems guarantee an excellent adaptation to all applications.

Variatron® and Quick Start® systems improve the efficiency of your industrial processes.

Protect the environment:

the management of air and gas mixing is entrusted to AGP® and GEM® systems that offer high and constant efficiency, while Variatron® system is constantly generating electric energy savings and guarantees acoustic comfort. IME®, RGC®, Diamond Head® and Free Flame® system reduce the combustion impact on the environment.

Finally, the industrial waste gases can easily be eliminated by the EDP® system.





Variatron®

To further improve the performance of heating or industry systems, elco is able to apply **Variatron®** (fan speed control) over the whole range of modulating burners.

In combination with **AGP®** system, we can ensure optimum combustion by constantly controlled minimum air excess in all operating conditions.

Variatron® can be integrated inside the burner or externally mounted for mono- or duoblock burners. Application of the **Variatron®** to elco burners results in:

- electrical consumption savings of the order of 50-60%;
- turndown ratios of up to 1:10, resulting in perfect adaptation to system requirements and improvement in average seasonal efficiency, in particular with condensing or low-temperature boilers or specific processes;
- silent start-up and average overall noise reduction of 2 dB (at maximum power) to 12 dB (at minimum power).



AGP®

Developed and produced by elco, the **AGP®** (proportional air-gas) system provides:

- perfect stability of the air-gas mixture;
- a constantly high CO₂ content over the whole burner power range;
- precise control of air excess, which is important for high-efficiency operation, in particular for condensing generators.

The **AGP®** measures:

- the gas pressure downstream of the gas train;
- the air pressure behind the flame holder;
- the furnace backpressure.

Any variations in the three pressures are immediately and simultaneously recorded by the system which automatically restores the correct gas/combustion air ratio.

AGP® maintains a constant gas/combustion air ratio even in the presence of:

- positive or negative variations in the gas pressure;
- variations in air flow due to changes in the electrical supply voltage or fouling of the ventilation system;
- variations in the furnace and flue draft pressure on start-up and during load changes.



RTC®

The functional design of the housing, coupled with the innovative technology of the combustion heads, creates the **RTC®** (Retained Head Adjustment), offering several advantages:

- full access to all components, by simply removing the cover;
- simple and rapid maintenance;
- complete removal of the combustion head and access to its internal components with a single operation, without removing the burner from the boiler or disconnecting the gas train;
- prolonged retention of the optimum combustion head settings, which are not changed during service operations;
- rapid cleaning of the mechanical components, thanks to their clear layout;
- reduced servicing times through the use of standard nuts, bolts, screws and pipe fittings, which can be adjusted using only a few tools.



GEM®

The latest and universally applied system is an electronic controller. It controls the position of one or more actuators simultaneously. The actuators of the air flow and fuel components are controlled by a microprocessor.

An additional advantage of the **GEM®** (electronic mix management) system is that it provides specific information on all the commands and states of the overall system: these can be accessed directly or by remote control. Digital programming is easy, either via a specific module or a computer.



Low Noise®

Among all the harmful things that men have to bear with every day, the most annoying is noise, which is difficult to reduce and expensive to get rid of.

This is the reason why elco has developed quiet burners both by selecting sound absorbent materials, and by treating each noise sources internally. The main noise comes from the air intake and the air mixing in the fan wheel: all the elco burners are equipped with a sound trap on the air intake channel leading to the fan. This brings the acoustic level to a compatible value with the environment.





Free Flame®

The principle of the **Free Flame**® oil combustion is based on rapid gasification of the fuel by recirculating the combustion gases internally and allows the fuel-air to mix quickly. Once the fuel has been vaporized, it will burn and stabilize 30 centimetres from the combustion head.

The flame appears to "float freely" hence the name "**Free Flame**". The heat absorbed by the gasification oil will cause a significant drop in the flame's temperature and a decrease in the formation of the thermal nitrogen oxide. The range EK6 to N10 burners operate on domestic oil using the "**Free Flame**" technology. An additional system can be used to control excess combustion air (O₂ regulation).



Diamond Head®

The principle of the **Diamond Head**® gas combustion is based on the internal recirculation of the combustion flue gases. These are partially drawn into the base of the flame via triangular openings positioned at the end of the combustion head.

The position and geometry of the gas injectors are such that a significant quantity of combustion flue gas is drawn in and rapidly mixed with air and gas at the root of the flame. This mixture crosses the main reaction area, slowing the combustion, which resulted in lowering the main flame temperature. The result of this staging combustion is a significant reduction in the formation of thermal nitrogen oxides.

The advantage of this internal recirculation technique is an automatic adjustment to the quantity of recycled combustion flue gases: the volume of the flame is always as low as possible, which has a very minor effect on the nominal power of the generator, unlike external recirculation systems.

An additional system can be used to control excess combustion air (O₂ regulation).



Quick Start®

Quick Start® is dedicated to industry applications. These applications require a high-temperature stability for process and a power production without interruption.

That is the reason why, for the first start up, there is a long preheating period, adjustable from 40 to 300 seconds.

After a controlled shutdown, the burner will instantaneously ignite the flame when heat is required by the system.

For the gas burners, a tightness control is required each time the burner will be stopped.

This working means:

- an increase of productivity that results from a minimum temperature variation, due to the control device;
- a primary and secondary energy savings;
- no thermal shock suffered by materials used to huge temperature variations;
- a really good security thanks to permanent control device.



EDP®

The most familiar process for the disposal of non-recyclable waste was incineration. RPD burners can be equipped, on request, with the **EDP**® (elimination of waste by pyrolysis): an additional injector spacer that disperses the gaseous substances to be eliminated around the main flame.

Liquids to be disposed of are atomized directly into the flame by one or more nozzles. Well mixed here, they are consumed at a temperature of between 1200 and 1400°C. Our research and development office studies all cases to which they are subject in order to be able to adapt the best possible solution to the problem posed.



RGC®

The **RGC**® (combustion gas recirculation) system is for some specific applications which require Low NO_x values through external injection of the combustion gases collected in their exhaust duct and powered into the flame by a turbine.

The reduction in NO_x follows the same principle as that of the diamond head, through the reduction of flame temperature that it brings about.

The **RGC**® is a complete assembly that comprises a stainless steel fan and an injection spacer for the injection of the combustion gases into the flame.

The flow of these gases is managed by a motorized valve or by a fan speed control.

The assembly is connected by insulated tubing.



FGV®

Industrial process boilers require that flames shape should be perfectly adjusted to the combustion chamber, in which they must develop.

Burners RPD and EK-DUO are equipped with **FGV**® (variable geometry flame): a crown of louvers placed the combustion head force rotation movement on the air flow. The faster the rotational movement is, the shorter and wider the flame, while if the rotational movement is slower, the flame will be long and narrow.



ISC®

The latest system patented by elco is the **ISC**® (Integrated Switch Cabinet) and the new generation of NEXTRON® burners features it.

The built-in switch cabinet contains all the controls and power devices of the burner allowing full customisation for each installation and each industrial process. Accessories such as power regulator and frequency inverter **Variatron**® can be integrated in the **ISC**®. This new design is the ideal replacement to bulky sound proof boxes.



Heating

TECHNOLOGIES



IME®

elco developed innovative combustion heads with two main priorities:

- power range identical to the corresponding standard burners;
- simplicity of manufacture, commissioning and maintenance.

The result is a "staged" combustion head, in which the gas is injected at different levels.

In the initial phase, combustion occurs with a large amount of air excess, and therefore low energy density. The flame therefore has time to cool down through radiation and for partial recirculation of exhaust gases, before the second phase, in which the remainder of the gas flow is injected. With the adoption of the **IME®** (Multi-stage Injection) up to 6 MW, fitted as standard on all gas burners, elco guarantees nitrogen oxide emissions less than 80 mg/kWh for natural gas combustion, measured according to the EN 676.



RHP®

RHP® (Recirculation with High Performance) is a powerful and quiet fan system, which exploits the principle of air re-injection. Part of the air, under pressure, is sucked in again by the turbine, significantly increasing the ability of the burner to overcome the back pressure of the generator on start-up.

This allows elco burners to adapt to all types of generator and also results in:

- rapid stabilization of the flame and combustion on start-up;
- elimination of vibration;
- reduction of pollutant emissions, in compliance with the applicable European standards;
- very low noise levels (insulated air passage).

In addition, the patented design of the air damper provides optimal regulation of the airflow even at low power settings.



MDE®

A microprocessor-based electronic system which records and stores all the operating data. This system improves burner management through better technical support by providing all the information necessary for analysis of operation and any faults which have occurred in the past.

The stored data can be displayed on a display fitted to the burner, using the special Elcoscope® reader or via a PC using the PC Interface software. It is possible to obtain different types of operating data:

- 1) instantaneous operating values (operating phase, supply voltage, ionization current, etc.);
- 2) statistical information (duration of operation, number of start-ups, number and type of shutdowns);
- 3) detailed information on the last two shutdowns;
- 4) technical details of the apparatus.

All this information is indicated in clear text.

This diagnostic information is particularly useful in resolving cases of sporadic shut-downs which cannot be reproduced in the presence of the support engineer.



MDE2®

The new **MDE2®** technology is the evolution of the **MDE®** technology.

MDE2® with integrated display, not only supplies and permanently shows all the information available with **MDE®** technology, but also supplies further information about fuel consumption, fuel availability into the tank and periodic service to be carried out. In the gas versions, the new **MDE2®** technology automatically carries out a check of the gas leakage control at each burner start-up. The safety level in the whole installation is improved.

In the industrial applications, the **MDE2®** control boxes adopt the **Quick Start®** technology that improve the burner performances by keeping the working temperature constant and by increasing the installation efficiency. The burner carries out the prevention phase only at the first start-up, for the next start-ups, the flame will appear immediately when heat is required again by the system. Besides, to satisfy all industrial exigencies, the following aspects of the **MDE2®** controllers can be adjusted by the means of a PC:

- permanent prevention;
- adjustable time of the postvention phase;
- adjustable time of the prevention phase, as alternative to the **Quick Start®** system.



