Heat treatment processes in the ceramics industry

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Safely, lower energy consumption and active environmental protection are issues of utmost importance for operators of industrial kilns.

Elster Kromschröder gas control and safety systems often do more to make industrial plants safe and to provide operating personnel with optimum protection than is required by the relevant standards and regulations.

High quality in combustion processes is achieved with adapted systems manufactured by Elster Kromschröder. Field bus components with communication capability control these systems.

Existing installations can thus be easily modernised and extended at low cost.

The specially coordinated product range offers excellent modular design options. For years now, we have been very successfully taking these important steps into the future of the modular system in kiln engineering.

All Elster Kromschröder systems are suitable for town gas, natural gas and LPG. In addition, we can supply a large assortment of reliable gas controls and burners for sewage gas, landfill gas, biologically produced methane, generator gas and coal gas.

Elster Kromschröder systems are a key cost-cutting factor because they are easy to assemble and install. Start-up procedures are accordingly short and straightforward. We also offer special training courses for various customer and product groups, should you want extra support. Our competent Service Team is also there to help.

Elster Kromschröder offers technically optimised concepts for your process engineering applications in the ceramics industry with a favourable price/performance ratio.

The design and rugged construction of the Elster Kromschröder kiln systems add up to a long service life. Preventive maintenance is essential for trouble-free operation, high availability and economy. This is why our Service Team offers you tailor-made maintenance contracts.

Multilingual leaflets and operating instructions, planning folders and Kromschröder System Technology manuals – available in print or on DVD – make it easy for you to operate products from our diversified range – from manual valves, gas filters and gas pressure regulators, etc. to complete systems. You can download up-to-date Elster Kromschröder information from the Internet at any time.

www.kromschröder.com
www.docuthek.com
Heat treatment processes in the ceramics industry

Kiln atmosphere and temperature distribution
Using Elster Kromschröder impulse burners with air/gas ratio control, it is possible to achieve an homogeneous temperature distribution throughout the kiln atmosphere. Based on an efficient cross-current principle, our burners ensure optimum mixing of gas and air.

Reduction systems
Reduction systems using Elster Kromschröder products allow low-pollutant production with uniform colour range without the additional use of coal and minerals. With our available know-how and an extensive range of products, we are capable of elaborating individual systems.

Hot air compensation
Flue gas temperatures must be kept as low as possible if a gas-fired installation is to work with a high level of efficiency. To do so, the heat in the flue gas can be returned to the process by directing it through heat exchangers in order to raise the temperature of the combustion air. Elster Kromschröder can supply the necessary control valves for gas and air.

Competence in gas technology
Owing to the use of ultra-modern technologies, Elster Kromschröder is an innovative partner in the fine ceramics and heavy clay industry.
We develop individual solutions in close cooperation with our industrial kiln builders.

Increase in efficiency thanks to self recuperative burner
Burners with integrated recuperator allow an energy saving of up to 30% due to air preheating up to 700°C.
They are used for direct heating or in conjunction with single-ended radiant tubes for indirect heating of kiln systems.

Lambda control and correction
Elster Kromschröder demonstrates its value as a competent partner in individual solutions – be it for constant lambda correction or as switchable oxidation/reduction cycles in a burner control system.
Staged control
Impulse control
The industrial kiln systems built for heavy clay production are mostly equipped with impulse control.
With this type of control, the output impulse from the burner is strong enough to produce a uniform distribution of temperature in the kiln atmosphere and a good level of circulation.

A pneumatic air/gas ratio control system (1) offers maximum safety thanks to air deficiency cut-out. A constant lambda value is maintained despite changing air pressures.
Staged control without a pneumatic ratio control system (2) offers the additional option of central lambda adjustment.
Continuous control

Intermittent shuttle kilns and tunnel kilns equipped with this control system are the low-cost solutions typically used in the production of heavy clay and fine ceramics. Continuous control combined with hot air is used to reach very high temperatures (e.g. engineering ceramics). Continuous control with a pneumatic air/gas ratio control system offers the advantage of a constant lambda value over a broad control range with simultaneous air deficiency cut-out.

Continuous control of the gas flow rate at constant air flow rate allows capacity adjustment with virtually constant outlet velocity at the burner.

Continuous control with an electronic air/gas ratio control system allows optional operation with constant lambda value over a broad control range, capacity adjustment with virtually constant outlet velocity at the burner and individual control of required O₂ or CO atmospheres.
Important products for your process

Pot burners BIC+SLG
Using Elster Kromschröder pot burners provides an homogeneous temperature distribution in reducing and oxidising kiln atmospheres.
Existing gas lances can be exchanged easily without additional installation effort. It is possible to adapt the burners to any pot cover on the basis of the well-known Elster Kromschröder high-velocity burners.

Annular excess air burners BIC+RSG
Regardless of the control method – be it impulse-controlled or modulating-controlled, the Elster Kromschröder annular excess air burner is designed for high-speed kilns with closed combustion chambers.
The secondary air allows the flame temperature to be matched to the kiln temperature with high burner impulse. The two-stage combustion allows a broad control range both in oxidising atmospheres and in reducing atmospheres. The secondary air injection achieves short cooling times.

Excess air burner BIC..L
This burner can be ignited at all output settings over the entire control range. The extremely high excess air reaching up to approx. 1500% ensures a very high pulse magnitude even at a low burner rating. The BIC..L is thus ideal for applications requiring precise temperature control and consistent product quality. The modular design means that it can be easily adapted to the kiln geometry.

Self recuperative burner ECOMAX®
Burners with integrated recuperator ECOMAX® allow an energy saving of up to 30% due to air preheating up to 700°C. They are used for direct heating or in conjunction with single-ended radiant tubes for indirect heating of kiln systems.

Burner BIC with integrated reduction lance
The time-tested Elster Kromschröder high-velocity burner can be fitted with an additional gas lance and separate gas connection to order. This lance allows it to be operated with a very high excess gas for reduction processes.

Burner BICA
This BIC burner version with reduced weight is an ideal complement in the capacity range of tunnel and roller hearth kiln systems.

Ceramic tube sets TSC
The TSC ceramic tube set range covers all conceivable conditions of use. There are different versions for various flame shapes, capacities, flue-gas outlet velocities or application temperatures. Ceramic tubes have proved their worth in the ceramics industry throughout the world.

Insulation package
Long-life burner insulation system to protect burners against aggressive kiln atmospheres and thermal load. This sturdy, patented system is directly mounted on new burners or can be retrofitted to existing installations. Suitable for ceiling and side-wall mounting.
Valve series valVario
The new valve series valVario can be used for safety, control and regulation purposes in air and gas supply systems to gas appliances. It can also be used for main gas control and safety systems.

valVario is designed for a maximum inlet pressure of 500 mbar and allows higher flow rates with the same nominal size. The space-saving, compact design means that it is easy to install. On the standard version, the flow adjustment can be checked using an indicator, whilst a blue LED is used to check the overall function. The device can also be fitted with a position indicator or proof of closure switch with integral visual indicator.

Actuators IC 20, IC 40
Elster Kromschröder also makes a significant contribution to the production of high-quality products in the fine ceramics and heavy clay industries by using high-quality kiln systems. This also includes actuators of the IC 20 and IC 40 series for direct mounting on butterfly valves BVG, BVA and BVH for gas, cold air and hot air up to 450°C.

The basic unit, actuator IC 20, is controlled by a three-point step signal.
Due to its outstanding flexibility, the IC 40 is suitable for various control types ranging from continuous control to staged control. It can be parameterised using a PC with a wide range of data being stored in a history storage.

Lambda controls with linear flow control LFC
The ever more stringent requirements applicable to the control quality of kiln atmospheres necessitate high-quality but nevertheless low-cost regulating units. Elster Kromschröder linear flow controls of the new generation meet these requirements. They can be used optimally for wide lambda and capacity ranges with continuous control for uninterrupted duty.

Automatic burner control units IFD 200 and IFD 400
The IFD series are designed for directly ignited burners in intermittent and continuous operation. Flame control with ionisation signal or UV sensor. The burner status and the level of the flame signal can be read directly from the unit.
IFD 200 with one gas valve output; restart can be activated on IFD 258. IFD 200-I with integral, electronic ignition.
IFD 400 has 2 valve outputs and is suitable for multi-flame control. Restart available as an option.

Burner control unit BCU®
The BCU® series replaces the local control cabinet. It unites the functionally interrelated components of automatic burner control unit, ignition transformer, operation-control module for Manual/Automatic mode and operating and fault diagnostic system in a compact housing. It is suitable for intermittent and continuous operation. Parameterisation and extended diagnostics using the PC software BCSofT.
BCU 370 for modulating-controlled forced draught burners with activation signals for the fan and control valve and also with a tightness control and Profibus-DP as options.
BCU 440 for ionisation-controlled, single-stage burners with optimised connection equipment for zonal wiring.
BCU 460, BCU 465 and BCU 480 for ionisation- or UV-controlled burners with optional Profibus-DP bus system.