Innovations which pay off
Safety, lower energy consumption and active environmental protection are issues of utmost importance for operators of industrial furnaces.

Safety
Kromschröder gas control and safety systems often do more than make industrial gas installations safe. They provide operating personnel with optimum protection to a much higher level than is required by the relevant national and international standards and regulations (Machinery Directive 89/392/EEC, Low-Voltage Directive 73/23/EEC, EMC Directive, Industrial Thermal Process Installations DIN-EN 746).

Customised systems
High quality in heat treatment processes is achieved with adapted systems designed by Kromschröder. Modern components through to the field bus interface control these systems. Even existing systems can be modernised and extended easily and at low cost.

Straightforward start-up procedures
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 courses of instruction for various customer and product groups, should you require extra support. Our competent Service Team is also there to help.

Optimum price/performance ratio
Kromschröder offers technically sophisticated concepts for your process engineering applications in the metalworking industry with a favourable price/performance ratio.

High availability due to the very best technology available and first-class service
The design and robust construction of the Kromschröder firing systems ensure a long service life. Preventive maintenance is essential for trouble-free operation, high availability and economy. For this reason, the Kromschröder Service Team can offer you tailor-made maintenance contracts.

Consumption measurement
Exact consumption measurements at the gas and air end are now state-of-the-art. Kromschröder offers a new generation of flow meters equipped with the most modern electronics and optional M-Bus interface. The actual consumption can be read off directly.

Simple operation
Multi-lingual leaflets and operating instructions and our catalogue on CD-ROM make it easy for you to operate products from our diversified range - from single components to all-in systems. You can download up-to-date Kromschröder information from the Internet at any time:

www.kromschroeder.de
Heat treatment systems in the metalworking industry

Quality
The production of high-grade products depends to a high degree on the quality of the firing systems used. Kromschröder is certified as complying with Standard DIN EN ISO 9001 for quality systems. Our organisation and technical processes and procedures are qualified to develop, manufacture and deliver products and services of assured quality.

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

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. Kromschröder can supply the necessary control valves for gas and air.

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

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

Competence in gas
Owing to the use of modern technologies, Kromschröder allows you an innovative partnership in the metalworking industry. We develop individual solutions in close cooperation with our customers.
Directly heated heat treatment plants

Example: Smelting in the aluminium industry

Structure of a heating system with continuous control

Function:
When the gas pressure control, measuring and safety system (1) is in operation, the burner control system can be placed into operation.
When the automatic burner control unit (15) is enabled, the solenoid valves for gas (3 and 4) open. At the same time, the ignition transformer (15) is supplied with voltage so that an ignition spark is produced at the burner nozzle in the burner (7). The motorised butterfly valve (12) is in ignition position so that the ignition air flows to the burner (7). A proportional outlet pressure is produced at the air/gas ratio control (4) via the impulse line. If heat is requested, the motorised butterfly valve (12) opens continuously. This causes a higher control pressure to act via the impulse line onto the air/gas ratio control (4) which results in a higher gas outlet pressure.
The maximum flow rates are limited by the adjusting cock (5) and the air flow rate control valve (13).
The function schematic shows the entire system equipped in accordance with European Standard EN 746-2 (Industrial Thermal Process Installations).
Directly heated heat treatment plants
Example: Annealing or forging
Structure of a heating system with low fire rate lance with continuous control

Function:
When the burner control unit (13) is enabled, the bypass solenoid valve of the air/gas ratio control (4) opens. At the same time, the low fire rate lance (6) is ignited via the burner control unit (13).

When the low fire rate lance (6) is in operation, the main burner (6) can be operated via the burner control unit (13) on request. For this purpose, the butterfly valve for air (7) must be in ignition position. Only then is the main gas solenoid valve (4) activated.

The capacity of the main burner (6) is controlled by varying the butterfly position of the butterfly valve for air (7). If heat is requested, the butterfly valve for air (7) opens steplessly. The increasing air pressure at the air/gas ratio control (4) via the impulse line produces a higher gas outlet pressure. This maintains the ratio between gas and air flow rate constant at all operating points. During entire operation, separate flame failure control of the low fire rate lance (6) and of the main burner (6) is performed by the burner control unit (13). The electronic flow meter DE (2) indicates the operating flow rate and the gas quantity consumed.

1. Manual valve AKT
2. Flow meter DE
3. Pressure gauge KFM with manual cock for pressure gauge DH
4. Air/gas ratio control with solenoid valve for gas and bypass solenoid valve for gas GVIB
5. Bellows unit EKO
6. Gas burner with integrated low fire rate lance BIC...L
7. Solenoid-operated butterfly valve MK with gear motor GT
8. Air adjusting cock LEH
9. Bellows unit EKO
10. Air pressure governor GDJ...L
11. Pressure gauge KFM with manual cock for pressure gauge DH
12. Adjusting cock GEH
13. Burner control unit BCU
**Directly heated heat treatment plants**

**Example: Drying**

Structure of a heating system with supplementary pipe and purging air orifices with continuous control.

1. Manual valve AKT
2. Gas solenoid valve VG
3. Air/gas ratio control GIK
4. Bellows unit EKO
5. Gas burner BIO with supplementary pipe and purging air orifices incorporated in flame conduit tube
6. Butterfly valve for air DKL with gear motor GT
7. Air adjusting cock LEH
8. Bellows unit EKO

**Function:**
The solenoid valve for gas (2) opens after the automatic burner control unit is enabled. At the same time, the ignition transformer is supplied with voltage via the automatic burner control unit, thus producing an ignition spark at the burner nozzle in the burner (5). The motorised butterfly valve (6) is in ignition position so that the ignition air quantity flows to the burner (5). A proportional outlet pressure is produced at the air/gas ratio control (3) via the impulse line. When heat is requested, the motorised butterfly valve (6) opens continuously. This causes a higher control pressure to act on the air/gas ratio control (3) via the impulse line which results in a higher gas outlet pressure. The maximum air flow rate is limited by the adjusting cock (7).
The supplementary pipe stabilises the flame and ensures complete combustion of gas and air in the flame. The purging air orifices ensure graded combustion which can influence the flame temperature. This is lowered adequately so as to prevent thermal destruction of the components. At the same time the burner (5) can be operated near-stoichiometrically at this operating point.
The flame conduit tube protects the flame against cooling as the result of the material being dried flowing past.
Indirectly heated heat treatment plants with recuperator burner

Example: Hardening

Structure of a heating system in the jacket radiant tube with pulse firing

Function

After being released by the automatic burner control unit IFS or BCU 465, the gas valve VG..L and the air valve VR..R open. At the same time the ignition transformer TGI is supplied with voltage so that an ignition spark is generated at the burner head in the BICR. The burner starts during the slow opening process for the gas valve VG..L and the air valve VR..R.

The bypass bore in the air valve VR..R ensures that a defined volume of purging air is fed to the burner.

The maximum gas and air flow rates are limited by the gas adjusting cock GEH and the air adjusting cock LEH.

The orifice assemblies FLS are designed to measure the gas and air flow rates.

1. Manual valve AKT
2. Gas solenoid valve (slow opening) VG..L
3. Flow rate adjusting cock GEH
4. Stainless steel bellows unit EKO
5. Measuring orifice (integrated in some burner versions) FLS
6. Burner with integrated recuperator BICR
7. Ignition transformer TGI
8. Automatic burner control unit IFS
9. Solenoid valve for air VR..R
10. Differential pressure switch; to be used as air deficiency cut-out in conjunction with BCU 465) DG
11. Flow rate adjusting cock LEH
12. Burner control unit BCU 465
Important products for your process

Burners BIO, ZIO, ZIC and BIC
Burners BIO and ZIO feature a steel tube for quarts or feature a burner supplementary pipe. Burners BIC are prepared for attachment of a ceramic tube set TSC made of silicon carbide. Capacity range 1.5 to 1,000 kW, modular structure, directly ignited and monitored, low-pollutant-emission thanks to optimised combustion and customised variants for various applications and types of gas are the outstanding features of this Series.

BICR
The BICR recuperator burner for direct and indirect heating of industrial furnaces and thermal process installations. Maintenance-friendly design, economical operation, directly ignited and monitored. Capacity range 21-82 kW. Flame outlet velocity 120-150 m/s. Environment-friendly, low-pollutant-emission combustion is the characteristic feature of the BICR burner. Customised variants and adaptation to various types of gas and mounting situations are possible.

Air/gas ratio controls GIK, GI
The air/gas ratio controls serve to maintain a constant gas/air ratio for continuous and stepped burner control. European Standard EN 746 demands that a burner always be ignited with a stable gas/air mixture. This requirement is met with the aid of the air/gas ratio control.

Air/gas ratio controls and variable air/gas ratio controls with solenoid valve, Moduline system
Air/gas ratio controls GVI and GVIB for maintaining a constant gas/air ratio. Variable air/gas ratio control GVRH for maintaining a constant gas/air flow rate ratio. The modular design principle of the flow bodies allows compact, space-saving control systems to be implemented.

Automatic burner control units IFS 258
These automatic burner control units ignite and monitor gas burners in intermittent operation. The fields of application relate to directly ignited gas burners of unlimited capacity (ignition rating <= 350 kW). Typical fields of application include industrial thermal process installations to EN 746. Moreover, the IFS 258 units can also be used on atmospheric burners. Functions: Flame failure control with ionisation sensor or with UV sensor, ignition and monitoring possible with one electrode, stepless switch-off sensitivity adjustable for the flame current, test socket for no-break flame current check, switchable from restart to immediate fault lock-out following flame failure, and with signalling contacts for operation and fault.

Burner control units BCU
Automatic burner control unit, ignition transformer and operation-control module in a compact metal housing take the place of the local control cabinet. For directly ignited burners or pilot and main burners in intermittent or continuous operation. Manual mode for burner adjustment. Optional Profibus-DP field bus interface, BCU...L with air valve control, BCU 465 with signal input for air flow monitoring. The integrated operating and diagnostics unit facilitates on-site commissioning and servicing. The unit displays the operating status of the burner module, the flame signal and unit parameters. In manual mode, the individual burners can be commissioned and adjusted independent of the higher-level process control system. The unit can be adapted to the specific application via an optical interface and the PC diagnostic and programming software, BC-Soft® for Windows. Comprehensive analysis tools such as line recorder or history storage facilitate commissioning and servicing of the heating system.
Competence in gas

Gas is considered to be one of the most important energy resources in today’s - and particularly tomorrow’s - world. Kromschröder is a leading manufacturer of top products and systems for measurement and control of gases, for automation of industrial furnaces and for control of heat treatment processes.

Through innovative research and development of trendsetting design, Kromschröder is a regular source of new impetus for this interesting market.

Modern production methods and staff-oriented production have made Kromschröder a competent partner.

Quality

Kromschröder’s quality policy is based on a globally acclaimed system for ensuring products and services of consistently high quality.

Certification in compliance with Standard DIN EN ISO 9001 confirms the efficiency of our system.

We are well aware, however, that a quality system is not enough on its own. It is only with the active support of our staff that we are able to keep our ears close to the ground in the market to enable us to respond quickly to our customers’ needs. With the strategy of steady, continuous improvement of all the processes involved in the creation and distribution of our products, we want to actively implement the requirements and expectations raised by the market because customer satisfaction is the standard we strive to achieve.

Environmental protection

Protection of the environment is a declared company aim at Kromschröder: A healthy company with a healthy working climate in a healthy environment. And with this, we also associate high product quality expected by today’s customers.

The experience and successes of the past ten years have shown that the path leading to this objective needs to be reformulated time and time again. We have learnt a great deal and also achieved a great deal, as shown by our annual, updated environment report.

Not least, pursuing great aims also necessitates having reliable partners to accompany us: Reliable staff, time-proven production and distribution partners and, above all, convinced customers. For our customers, natural gas is the economical and environment-friendly energy source.

Inspection and certification worldwide

Approval or certification in accordance with applicable national or international standards and specifications is a matter of course with safety equipment and systems.

By participating in relevant international bodies and standards committees, we at Kromschröder ensure that our customers’ interests are represented in international standardisation activities.

We want to use the most modern technologies and treat our environment with all due respect.

Aims:

Kromschröder wishes to consolidate its good market position in the metalworking industry.

Kromschröder is committed to producing high quality and to being a supplier of leading-edge technology.

We at Kromschröder understand that the quality of our products must conform with the properties and features of market standards and our customers’ expectations.
The addresses of our international sales outlets can be found on the Internet:

www.kromschroeder.com ► information ► contacts