

Elemental analyzer

multi EA[®] 5000



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The multi EA[®] 5000 is a powerful elemental analyzer with a convincing overall concept for the determination of Total Carbon, Total Nitrogen, Total Sulfur and Total Chlorine.

Liquid, solid, gaseous and LPG samples can be analyzed directly and without any laborious pretreatment. The multi EA[®] 5000 offers for each kind of sample matrix an optimized sample introduction system.

Unique Features

- Real **multi-matrix** analyzer for liquids, solids, gases, LPG samples
- Real **multi-element** analyzer for the determination of Carbon, Nitrogen, Sulfur and Chlorine in one analysis cycle
- Simultaneous Carbon, Nitrogen and Sulfur determination, sequential determination of Chlorine
- Automatic switch-over between Carbon, Nitrogen, Sulfur and Chlorine determination without hardware changes
- Unique sensitivity for Carbon, Nitrogen, Sulfur and Chlorine in ultra trace analysis
- Outstanding wide operation range from lowest ppb–wt-%
- Revolutionary **FAST** connection technique guarantees simple operation free of gas leaks
- **Self Check System** (temperature, gas flow, pressure and tightness control) for trouble-free operation and highest ease of use combined with low maintenance effort
- **Flow Management System** enables stable gas flows and system tightness check for operating safety and reliable analysis results
- The optional **double furnace technology** enables vertical and horizontal operation with only one system. That allows a perfect adjustment of the combustion process to the requirements of every sample matrix
- **Flame sensor technology** for trouble free matrix-optimized combustion in horizontal mode
- **Intuitive user guidance** by multi Win[®] software avoids operator mistakes
- Only one **multi-matrix sampler** for vertical and horizontal mode necessary. It enables automatic introduction of liquids, solids, EOX samples, AOX samples and TOC samples, as heated version for injection of viscose liquids available

Efficient Combustion of Samples

High-temperature oxidation

High combustion temperatures of up to 1100 °C ensure complete oxidation of samples and reliable analysis results.

Catalyst free combustion, because of the high temperature no additional expensive catalyst is necessary for the quantitative decomposition of the samples.

Required gases; Argon (min. quality 4.6) and Oxygen (min. quality 4.5)

The multi EA[®] 5000 combines vertical and horizontal operation mode in one and the same device. The use of only one **multi-purpose combustion tube** for all standard applications, whether horizontal or vertical, makes conversion child's play. It is not necessary to change tubes.

Combustion in horizontal mode

The optional flame sensor technology guarantees a complete and trouble-free combustion.

The combustion process is adjusted automatically by means of the flame sensor to the requirements of each individual sample.

Combustion in vertical mode

The special construction of the multi-purpose combustion tube guarantees a complete and trouble-free combustion of liquid, gaseous and LPG-samples. Only one combustion tube is used for all sample matrices, no hardware change necessary.

Sample Introduction Systems

Automation of the multi EA® 5000 gives you a higher sample throughput for solids and liquids than has ever been reached before, both in vertical and horizontal operation. Special modules for gas and LPG analysis have been optimized for the tasks in question. Our sampling systems combine extremely high ease of use and ultra-modern technologies with maximum safety for the user.

MMS 5000 – The Real Multi-Matrix Sampler

The MMS 5000 can be operated in vertical as well as horizontal mode. The same sampling system can be used also for liquids and solids, EOX, AOX, and TOC samples.

The sample volume and injection speed (liquids) can be selected and adjusted by the user. For liquid sampling additional rinsing steps with sample or a pure solvent can be performed automatically by the sampler.

Autoinjector – Automatic Injection Without Autosampler

The autoinjector is suitable for the injection of liquids in vertical as well as horizontal operation mode. Standardized filling volumes by means of one-step filling eliminate subjective faults being made by different operators.

GSS Module

The GSS module is optimized for the introduction of samples in the gaseous state. The sample volume and introduction speed can be adjusted for each gas type separately by the user.

LPG Module – Unique Precision Even at Low Sample Pressure

The LPG module is optimized for the automatic and precise introduction of liquefied pressurized gases (LPG). No additional sample pressurization is required. A special Peltier cooling for the sampling valve avoids uncontrolled evaporation and bubble formation. A heated evaporation chamber guarantees a complete transfer of even low volatile components into the gaseous state.

GSS/LPG Combi Module – Intelligent Combination for Pressurized Gases:

The GSS/LPG combi module is a perfect solution for multiple gas analysis. It incorporates all advantages of the LPG module.

Memory-effects and cross-contamination are eliminated due to the use of two independent analysis branches.

	Determination of Nitrogen	Determination of Sulfur
Detection Principle	Chemoluminescence (CLD)	UV-Fluorescence (UVFD) Coulometric titration (Coul.)
Measuring Range (liquids)		
<i>Upper Limit*</i>	10.000 mg/l	10.000 mg/l 40.000 mg/l
<i>Detection Limit**</i>	30 µg/l	5 µg/l 0,6 mg/l
Operation Range (mass)		
<i>Upper Limit*</i>	16 µg N absolute	16 µg S absolute 200 µg S absolute
<i>Detection Limit**</i>	0,6 ng N absolute	0,2 ng S absolute 0,2 µg S absolute
Sample Quantities	max. 100 µl (liquids) max. 500 µl (water) max. 100 ml (gases) max. 100 mg (solids)*** max. 50 µl (LPG)	max. 100 µl (liquids) max. 100 ml (gases) max. 100 mg (solids)*** max. 50 µl (LPG)
Measuring Time**	vertical: 4 min horizontal: 9 min	vertical: 4 min horizontal: 9 min
Furnace Temperature	max. 1100 °C	max. 1100 °C
Gas Supply	Argon 4.6, Oxygen 4.5 (both, free of halogens & hydrocarbons)	
Power Supply	100–240 VAC, 50/60 Hz, max. 16 A	
Dimensions (W x H x D) (without PC and monitor)	<i>Basic device (vertical):</i> 513 mm x 464 mm x 551 mm <i>Basic device incl. automatic boat drive (horizontal):</i> 1073 mm x 464 mm x 551 mm <i>Accessory module without basic device:</i> 296 mmx464 mmx492 mm	

	Determination of Carbon	Determination of Chlorine
Detection	Infrared spectrometry (NDIR)	Coulometric titration
Measuring Range (liquids)		
<i>Upper Limit*</i>	100 wt-% (organics) 10.000 mg/l (water)	100.000 mg/l
<i>Detection Limit**</i>	100 µg/l (organics) 200 µg/l (water)	100 µg/l
Operation Range (mass)		
<i>Upper Limit*</i>	50.000 µg C absolute	1000 µg Cl absolute
<i>Detection Limit**</i>	0.3 µg absolute	10 ng Cl absolute
Sample Quantities	max. 100 µl (liquids) max. 500 µl (water) max. 100 ml (gases) max. 100 mg (solids)*** max. 50 µl (LPG)	max. 100 µl (liquids) max. 100 ml (gases) max. 100 mg (solids)*** max. 50 µl (LPG)
Measuring Time*	vertical: 4 min horizontal: 9 min	vertical: 8 min horizontal: 10 min
Furnace Temperature	max. 1100 °C	max. 1100 °C
Gas Supply	Argon 4.6, Oxygen 4.5 (both, free of halogens & hydrocarbons)	
Power Supply	100–240 VAC, 50/60 Hz, max. 16 A	
Dimensions (W x H x D) (without PC and monitor)	<i>Basic device (vertical):</i> 513 mm x 464 mm x 551 mm <i>Basic device incl. automatic boat drive (horizontal):</i> 1073 mm x 464 mm x 551 mm <i>Accessory module without basic device:</i> 296 mmx464 mmx492 mm	

* depending on configuration, method settings and operation mode of analytical system

** depending on the selected injection volume, the purity of the vessels, chemicals and gases used, and the qualification of the operator and the used method

*** depending on density, homogeneity and shape of sample material