

Analytik Jena

Product Overview Analytical Instrumentation



Superior Technology from Jena

Analytik Jena manufactures high-end analytical instrumentation, accessories and software solutions ready for analytical demands of molecular, optical and mass spectrometry, sum parameter and elemental analysis.



Optical and Mass Spectrometry

- novAA® and ZEEnit series (LS AAS)
- contrAA® series (HR-CS AAS)
- Accessories for AAS
- mercur – mercury analyzer (AFS)
- TOPwave® – microwave digestion
- PlasmaQuant® PQ 9000 series (ICP-OES)
- PlasmaQuant® MS series (ICP-MS)
- SPECORD® S 600 (UV/Vis)
- SPECORD® PLUS series (UV/Vis)
- Broad range of accessories
- PHOTOCHEM® (PCL)

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Sum Parameter Analysis

- multi N/C® series (TOC/TN_b)
- Accessories for TOC-, TN_b-, AOX/TOX analyses
- multi X® 2500 (AOX/TOX/EOX)

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Elemental Analysis

- multi EA® 4000 (C, S, Cl)
- multi EA® 5000 (C, N, S, Cl)

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Innovation for Analytical Solutions

Analytik Jena stands for high-end analytical instrumentation with superior quality made to the demands of our customers. Innovative technology that convinces with a unique analytical performance is continuously developed and manufactured at R&D and production sites throughout Germany.

Tradition with innovative power

Analytik Jena takes pride in a long history and tradition of developing high-end analytical instrumentation, which dates back to the inventions made by Ernst Abbe and Carl Zeiss in Jena over 150 years ago.

Within the last 25 years Analytik Jena has become one of the most innovative manufacturers of analytical measuring technology that serves the demands of routines laboratories as well as of sophisticated niche applications worldwide.

Industries and fields of application:

- Pharma
- Clinical & Forensics
- Energy & Power Plants
- Chemistry & Polymers
- Geology, Mining, Metals
- Food & Agriculture
- Oil & Gas
- Environment
- Academic

Molecular, Optical and Mass Spectrometry – Advanced Technology for Versatile Applications

Analytik Jena's wide range of spectroscopic techniques offers instrumental solutions for all application requirements. Accessories, auto samplers and a system for microwave digestion complement our product portfolio.



Spectrometry Range

Advanced Technology



Atomic Absorption Spectrometers (AAS)

novAA® | ZEEnit



novAA® 400 P

A new generation for the whole range of AAS

The AAS series novAA® & ZEEnit combine high performance, versatility, automation, reliability and robustness.

novAA® & ZEEnit at a glance:

- 8 lamp changer for maximum automation and sample throughput
- Fully automatic gas box and automatic burner height adjustment
- Single and double beam optics
- Integrated high end vision tool for best observation of the operations
- Fully automated optimization routines
- Analysis of liquid and solid samples

novAA® 350 – Fully automated AAS for flame and hydride technique with D2 background correction

novAA® 400 P – Compact AAS for flame, hydride and graphite technique with D2 background correction

The **ZEEnit P** series combines an outstanding graphite furnace concept with the most powerful and latest generation of Zeeman effect background correction with variable magnetic field strength.



ZEEnit 700 P

This is unique:

- 2Field Mode – maximum sensitivity
- 3Field Mode – expansion of the linear working range
- Dynamic Mode – automatic adaptation to varying element concentrations without dilution

ZEEnit 650 P – High-performance graphite furnace AAS with Zeeman- and D2 background correction

ZEEnit 700 P – High-performance tandem AAS for flame, hydride and graphite technique with Zeeman- and D2 background correction

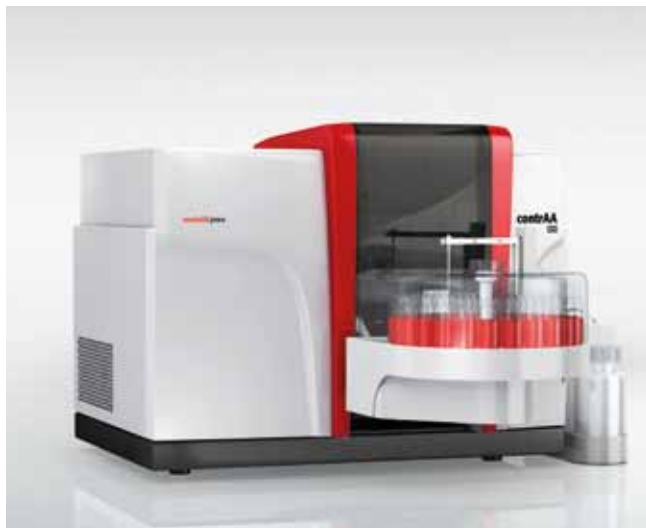
Accessories for flame analysis

The **Segmented Flow Star (SFS)** for flow injection operation simplifies the analysis of samples with high salt, high sugar or acid content. It guarantees stable burner conditions by continuous rinsing and constant flame temperatures and allows automatic metering of smallest sample volumes (µl range).

The **„Scraper“**, an automatic, software-controlled cleaning device for the nitrous oxide burner head, guarantees a continuous and reproducible operation over a long period.

High-Resolution Continuum Source AAS

contrAA®



contrAA® 800

contrAA® – A vision becomes reality

contrAA® closes the gap between ICP-OES and AAS. All systems of the contrAA® 800 series combine intelligent design with premium functionality and convincing performance:

- Multi Element – One light source for fast sequential and simultaneous multi-element analysis
- High-Resolution Optics – Interference-free analysis and highest precision
- HD Spectrum – High-resolution 3D spectra display for detailed spectral information
- Dynamic Mode – Extended measurement range of up to 5 orders of magnitude

Simple method development

The user is free to select the line best suited for the analytical task. As the intensity of the analytical line and the spectral environment are recorded simultaneously, noise or interferences are immediately visible and can be evaluated.

With only one light source, the Xenon lamp, the instrument is ready to measure all elements and at all available wavelengths from 185 – 900 nm. Patented technology enables the spectrometer to change rapidly from line to line and measure the elements in optimized measurement sequences. Thus, sequential multi-element routine in AAS has become standard.



contrAA® 800 F – HR-CS AAS for flame and hydride technology

contrAA® 800 G – HR-CS AAS for graphite furnace technology, including solid AA® and HydrEA

contrAA® 800 D – The most versatile system for HR-CS AAS offering flame, hydride and graphite furnace technology, including solid AA® and HydrEA.

Expanded application range

Evaluation of atom lines and molecular bands allows the analysis of additional elements like non-metals – an innovation.

Unique background correction

The contrAA® is the first AAS capable of separating broadband and spectral background effects. Fully automatic background correction routines use the available reference pixels and enable realtime simultaneous correction.

3D Spectrum – a new dimension

The 3D Spectrum, absorbance versus time and wavelength, offers unimagined possibilities for parameter optimization. The HR-CS AAS user can now identify the cause of interferences and eliminate them, as required.

Modules for AAS

Mercury/Hydride Systems | solid AA[®]



Hydride system

Multiple solutions for special challenges

The availability of flow injection and batch mode at the various automation levels guarantees convenient handling and precision as well as efficiency during the analysis of hydride forming elements and mercury: **traditionally** using atomization in the electrically heated **quartz cell** or **future-oriented** via coupling hydride formation with electrothermal atomization in the graphite tube (**HydREA**)!

- Flow Injection Mode: fully automated mode with optimized gas/ liquid separator and membrane drying system ensures high sample throughput
- Batch Mode: special designed reactors for large sample volumes, for foaming samples and low element concentrations
- Enrichment Mode: integrated gold collector unit for the enrichment of mercury
- Modular design: all functions can be upgraded, the system grows with changing lab requirements

HS50 – Simple Batch Mode, flame heated cell
HS55 – Batch Mode, electrically heated cell
HS60 – Fully automated system with Flow Injection and electrically heated cell



Sampler for direct solid AAS – solid AA[®]

solid AA[®] – direct solid AAS

Solid and paste like samples, as powders, cream or viscous oils can be analyzed directly in the graphite furnace. In direct solids analysis, the decomposition of the sample matrix by means of an acid digestion is replaced by the temperature program of the graphite furnace.

solid AA[®] at a glance:

- Analysis of the original sample
- Wide measurement range – no dilution required
- Analysis of small sample quantities – solid AA[®] is a micromethod
- Avoiding harmful reagents – chemical waste is kept to a minimum
- Simple handling – samples are simply placed on the sample carrier and analyzed directly
- Fast results

All graphite furnace systems by Analytik Jena can be upgraded with the solid AA[®] technology.

SSA 6 – Manual solid sampler
SSA 600 – Fully automated solid sampler with integrated microbalance
Liquid dosing unit – Upgrade kit for dosing liquids automatically on the SSA 600

Mercury Analyzer

mercur



mercur

Mercury analysis with best analytical certainty

Atomic fluorescence spectrometry (AFS) is the method of choice in mercury analysis down to the ng/L level. AAS has the advantages of a greater degree of robustness with complex sample matrices. The instruments of the mercur series combine the advantages of both detection techniques for the whole range of mercury analysis. Various configurations allow an adaption to specific application tasks and ensure compliance with EPA and EN/ISO norms.

mercur at a glance:

- Highly automated and fast – continuous flow injection with or without autosampler and unique FBR routine
- Safe – bubble sensor, specially optimized drying membrane and cascade enrichment
- Efficient – intelligent gas-liquid control; minimum reagent consumption and short measurement times
- Reliable – Self Check System (SCS)

mercur / mercur PLUS* – cold vapour technique using Atomic Fluorescence (with/without enrichment)
mercur AA / mercur AA PLUS – cold vapour technique using Atomic Absorption (with/without enrichment)
mercur DUO / mercur DUO PLUS* – Tandem mercury analyzer based on Atomic Fluorescence and Atomic Absorption (with or without enrichment)

* Two gold collectors available, for single or cascade enrichment.

Microwave Digestion

TOPwave®



TOPwave®

TOPwave® provides a wide range of applications. Its patented sensor concept and intelligent design enable reaction control and operating safety at the highest level. Effective sample preparation is achieved by facilitating high sample throughput through short cycle times and high capacities.

Another crucial factor is safety. Working under exceptional conditions requires an absolutely reliable system and an experienced partner.

TOPwave® at a glance:

- High sample throughput
- Minimum number of consumables
- Sensor concept which documents all digestion parameters of each sample thanks to wireless optical temperature control with RTM, wireless optical pressure control with RPM and SMART reaction control
- Self Check System (SCS)



Digestion vessels, easy to use without tools

High-Resolution Array ICP-OES

PlasmaQuant® PQ 9000 / PQ 9000 Elite



PlasmaQuant® PQ 9000 Elite

Impressive analytical performance

The unique resolving power, unmatched sensitivity and exceptional matrix tolerance of the PlasmaQuant® PQ 9000 Elite consistently offer the lowest detection limits and highest ease of use in demanding applications. Warranting the highest precision it is the first choice for advanced material analysis, research and quality control labs facing complex matrices including refractory, ferrous and high-purity metals, rare earths and petrochemicals.

With a clear emphasis on wide applicability, simplicity and cost-effectiveness the PlasmaQuant® PQ 9000 ensures excellent plasma performance, detection limits and accuracy in general applications. Fulfilling the demands of agricultural, food and environmental analysis it is a convincing all-rounder with enhanced productivity and operator comfort.

PlasmaQuant® PQ 9000 – cost effective analysis without compromises

PlasmaQuant® PQ 9000 Elite – the Number One ICP-OES in spectral resolution and sensitivity



PlasmaQuant® PQ 9000 / PQ 9000 Elite at a glance:

Innovative components of the PlasmaQuant® PQ 9000 series set a new standard in analytical performance:

High-Resolution Optics*

- Double-monochromator Echelle Optic for interference-free analytics
- HR-CCD detection with exceptional wavelength accuracy

V Shuttle Torch

- Vertical plasma torch with shuttle design for carefree operation
- Plug-and-play installation with precision auto-alignment

Dual View PLUS

- 2+2 plasma views for extended working range
- Argon-neutral counter-gas technology for unique sensitivity

High-Frequency Generator

- Unrivalled plasma performance for direct analysis of extreme matrices
- Short warm-up for high method flexibility and low running cost

*only available in the PlasmaQuant® PQ 9000 Elite

High-Performance ICP-MS

PlasmaQuant® MS / MS Elite



PlasmaQuant® MS Elite



Powerful, patented technology

The PlasmaQuant® MS is the world's highest performing quadrupole ICP-MS with unsurpassed sensitivity of over 1.5 million counts/second/ppb.

The PlasmaQuant® MS is optimized for routine applications in environmental including waters, wastes, soils and sediments, food and agriculture, chemicals and petrochemicals as well as for quality control in the semiconductor industry where plasma robustness to handle complex sample matrices is paramount.

The PlasmaQuant® MS Elite is designed for maximum sensitivity to deliver lowest possible detection limits for research applications. It measures the smallest nanoparticles and detects drug-tracing elements at below parts-per-trillion level. The Elite is also perfect for laser ablation analysis, isotopic-ratio measurements and chromatography techniques to separate analyte species.

PlasmaQuant® MS – for routine-analysis, with iCRC and lowest argon gas consumption

PlasmaQuant® MS Elite – Research-grade ICP-MS with industry leading sensitivity and lowest argon gas consumption

PlasmaQuant® at a glance:

The series provides unsurpassed limits of detection for over 75 elements. Fast, accurate and precise analysis of all sample types from ultra-trace to major concentration levels in a single, interference-free measurement.

Eco Plasma

- Robust plasma performance
- Requires only half the Argon gas

iCRC – integrated Collision Reaction Cell

- Fast, simple interference-free analysis
- New BOOST technology drives performance further

ReflexION

- Reflecting ion mirror with 3D ion focus
- Maximum sensitivity across the entire mass range

HD Quadrupol

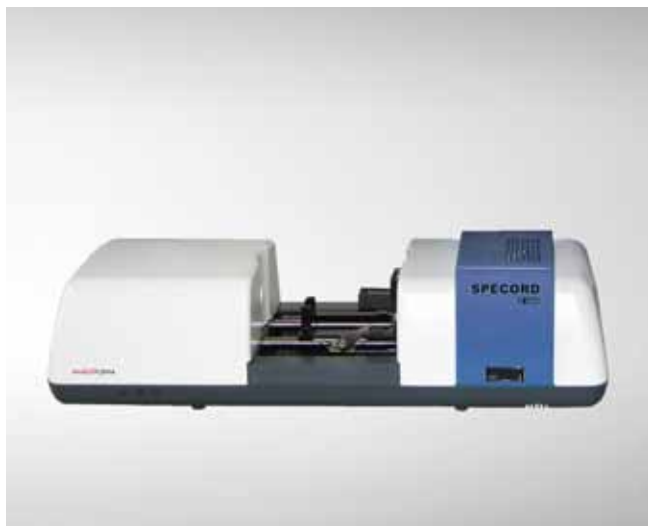
- True 3MHz Quad with industry leading abundance sensitivity
- Very fast and precise scan rates

ADD¹⁰ – All-Digital Detection System

- One-of-kind all-digital detector
- 10-orders of magnitude of linear dynamic range

UV/Vis Spectrophotometers

SPECORD®



SPECORD® S 600

New standards in UV/Visible spectrophotometry

The SPECORD® series provides high-performance real double-beam instruments with Cooled Double Detection, spectrophotometers using Split-Beam-Technology and high performance diode-array systems for simultaneous high-speed measurement. All our powerful spectrophotometers operate in the spectral range of 190 -1100 nm, resp. 185 - 1200 nm for SPECORD® 210 PLUS. A versatile software, specific tailor-made software packages and an extensive range of accessories guarantee for flexible, highly efficient and convenient operation in various fields of application.

SPECORD® S 600 – diode array system

SPECORD® S 600 combines the precision and convenient handling needed in laboratories with speed, reliability and superior optical performance.

SPECORD® S 600 at a glance:

- High precision diode array systems
- Excellent spectral properties, fast measurement of complete spectra in less than 12 milliseconds
- Self-adjusting photometric linearity, automatic stray light correction, open sample compartment

SPECORD® S 600 – Diode array spectrophotometer for UV to NIR range (190-1100 nm)



SPECORD® PLUS

SPECORD® PLUS

Routine analysis or special applications – with the double beam spectrophotometers of the SPECORD® PLUS series you are well prepared for all requirements.

SPECORD® PLUS series at a glance:

- Automatic accessory recognition
- Large, easily accessible sample compartment
- Extensive method collection
- „Device Check“ software and Self Check System (SCS)

SPECORD® 50 PLUS – Double-beam spectrophotometer with Split-Beam-Technology
SPECORD® 200 PLUS – Double-beam spectrophotometer with fixed spectral bandwidth
SPECORD® 210 PLUS – Double-beam spectrophotometer with 5 variable spectral bandwidths
SPECORD® 250 PLUS – Double-beam spectrophotometer with 5 variable spectral bandwidths and double monochromator



SPECORD® PLUS Dissolution is fully integrated into the system software of the dissolution providers.

UV/Vis Spectrophotometers

Variety of accessories



Adjustable cell holder with ultra-micro cell for extremely small sample volumes



Double 8-cell changer



Reflectance attachment with variable angle



Autosampler for particularly high sample throughput



15-cell changer



Sipper system



Solid sample holder



Integrating sphere

Getting the Antioxidant Picture

PHOTOCHEM[®]

PHOTOCHEM[®] offers a simple, rapid and accurate method for the determination of lipid and water soluble antioxidant capacities using photochemiluminescence on a single system. The method combines the very fast photochemical generation of free radicals with the highly sensitive detection in nmol range.

PHOTOCHEM[®] at a glance:

- Photochemiluminescence - high sensitivity, speed and accuracy
- Intuitive software navigation and easy operation
- Extremely short measuring times (20 sec - 3 min)
- Independent of pH and temperatures
- Needs only a few µl of the sample
- Ready-to-use kits
- Simple handling: sampling, measurement and rinse cycles are automatic



PHOTOCHEM[®]

Water and Environmental Analysis Made Easy – Using Clever Solutions by Analytik Jena

Whether analysis of drinking water and waste water, pharmaceutically used water or cleaning validation, surface water, through to solid substance analysis, e. g., TOC determination in sewage sludge or soils, optimized solutions by Analytik Jena make sum parameter analysis easy and efficient.



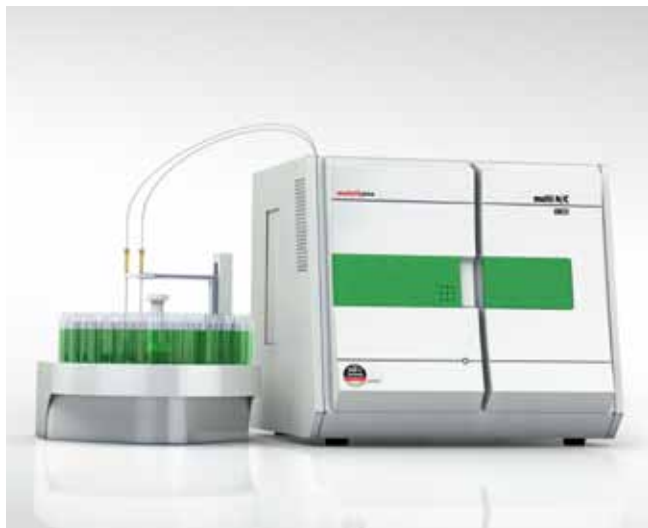
Sum Parameter Analysis

Clever Solutions



TOC-, TN_b Analyzers

multi N/C®



multi N/C® 3100

multi N/C® – High Performance TOC analyzers!

Using the instruments of the multi N/C® series, parameters as TOC, NPOC, POC, TC, TIC and TN_b can be measured quickly, easily and without any conversion in aqueous samples. Separate solids modules, as Double Furnace or HT 1300, allow the digestion of solid samples at up to 1300 °C in a robust ceramic tube.

The available autosamplers with integrated sample homogenization, automatic acidification and purging provide a high degree of automation for diverse requirements in TOC analysis. Time-optimized processes, such as parallel analyzing and purging in NPOC mode, increase the sample throughput.

multi N/C® 2100 – Space-saving TOC/TN_b analyzer for environmental analysis (direct injection)

multi N/C® 3100 – Allrounder for all TOC applications with high sample throughputs

multi N/C® UV HS – TOC system using oxidation agent (peroxodisulfate) and UV radiation source for sample oxidation, well proven in complicated matrices

multi N/C® pharma – for pharmaceutical applications, sample digestion using catalytic high-temperature combustion up to 950 °C or wet chemical oxidation in a High Power UV reactor



multi N/C® UV HS

multi N/C® at a glance:

- Wide measurement range – also without sample dilution: precise detection due to high-quality Focus Radiation NDIR Detector® for TOC, the chemiluminescence-detector (CLD) or the solid state chemodetector (ChD) for TN_b
- VITA® Flow Management System: for stable device performance and highly reproducible analysis results
- Easy Cal: easy calibration with just one standard for the most different applications, including long-term stability
- Auto-Protection: effective cleaning of measuring gas and monitoring protect valuable system components
- Reliable oxidation: high-temperature combustion (up to 950°C) or High Power UV reactor
- Variable injection techniques: valve-free direct injection or flow injection
- Suitable for simultaneous TN_b determination
- Double furnace technology – the ideal combination for water and solid samples without the need of an additional furnace
- Self Check System (SCS)
- Compliant with the valid national and international standards, such as: ISO, EN, DIN, EPA, ASTM, FDA and pharmacopoeias.

TOC, TN_b, AOX/TOX Analyzers

High sample throughput



Autosampler for 10 samples



Autosampler for 52/72/100/146 samples



HT 1300 – solid sample feeding



Autosampler for 60/112 samples



Sample preparation system using column method, for up to 6 samples simultaneously



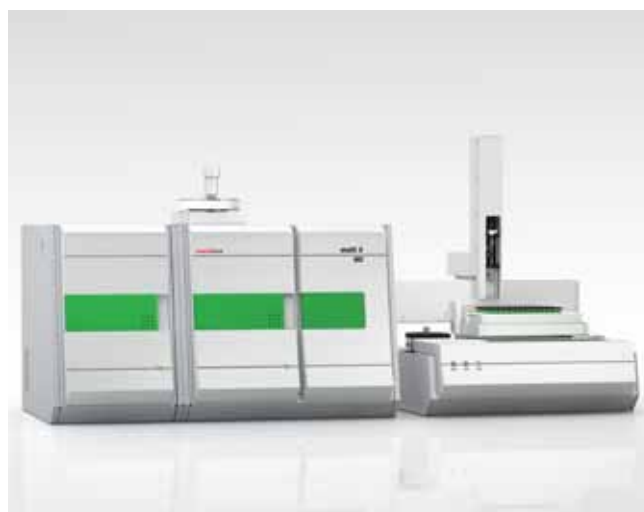
Double furnace technology – sample feeding for determining TOC in solids

AOX/TOX Analyzer

multi X[®] 2500

Whether POX, fastest AOX routine analysis in vertical operation mode or reliable determination of the smallest EOX trace concentrations in horizontal operation mode, the double furnace technology of the multi X[®] 2500 allows to select the appropriate combustion mode for every application.

The intelligent software multiWin[®], the fast changeover between column and batch method, and the user-friendly design ensure outstanding ease of use. Modules for sample preparation according to column or batch method as well as diverse sampling systems ensure flexible and cost-effective operation.



multi X[®] 2500

A New Dimension of Elemental Analysis

Due to innovative technologies, C/N/S/Cl elemental analyzers by Analytik Jena provide unparalleled flexibility, reliability and ease of use. Whether solid, liquid, paste-like or gaseous samples, using multi EA[®] you meet the most varied analytical challenges with ease.



Elemental Analysis

Innovative Technologies



C, S, Cl – Solids

multi EA[®] 4000



multi EA[®] 4000

Simple and flexible C, S, Cl analysis in solids

multi EA[®] 4000 convinces with its ease of use, analysis flexibility, and particularly excellent instrument stability and precision. It allows a unique combination of elements and parameters to be analyzed, TS, TC, TX, TOC, TIC, EC, and BOC. Therefore it is unchallenged in waste analysis! The modular design of the device allows to expand the application options from one element to fully automated multi-element analysis.

multi EA[®] 4000 at a glance:

- High ease of use and flexibility
- Enhanced analysis with precision and reliability
- Minimal operating costs and low maintenance effort

Fully automated TOC determination – TIC Solids Module

The TIC Solids Module “automatic” allows for an automatic determination of the Total Inorganic Carbon (TIC) in solid samples. Thus also enabling an automated determination of the Total Organic Carbon (TOC) using difference or direct method. Additional sample pre-treatment like manual acidification is not necessary!

N, S – Liquids/Gases

compEAct N /

compEAct S and S^{MPO}



compEAct

Efficient TS and TN determination in liquids, gases and LPGs in the smallest of spaces

The stand-alone instruments of the compEAct series combine efficient, catalyst-free high-temperature combustion with highly sensitive HiPerSens[®] detection, thus offering excellent analytical performance and application flexibility along with a high ease-of-use.

- EAsy Fit – Intelligent design for efficient operation in the smallest of spaces
- EAsy Touch – Integrated control and data evaluation unit with intuitive touch operation
- EAsy Protect – Maximum protection through automatic monitoring and optimization of all process parameters
- HiPerSens[®] detection – Broadest measurement range without sample pretreatment for unique applicability

compEAct N – Elemental analyzer for total nitrogen (TN) determination

compEAct S – Elemental analyzer for total sulfur (TS) determination

compEAct S^{MPO} – Elemental analyzer for interference-free sulfur (TS) determination in fuels and other refinery samples

C, N, S, Cl – in any Kind of Sample

multi EA® 5000



multi EA® 5000 with multi-matrix autosampler and GSS/LPG combi module

C, N, S, Cl trace analysis in gaseous, solid and liquid samples

The multi EA® 5000 is a universal talent to be used in various fields of application for the determination of C, N, S, Cl and also TOC, EOX and AOX/TOX. The globally unique double furnace technology offers fast and optimum adaptation to the sample matrix and analysis standard with minimal effort. Its unique modular principle allows an individual configuration and adaption of the multi EA® 5000 to growing needs and requirements.



The multi-matrix autosampler for vertical and horizontal applications, liquid and solid samples saves working time

multi EA® 5000 at a glance:

- Multi-application, liquid, paste-like, solid, gaseous and LPG samples
- Multi-element, C, N, S and Cl as well as TOC, EOX and AOX/TOX
- Extended measuring range from ppb to the percentage range
- Preset standard methods
- Standard compliance, e.g. ASTM, EPA, DIN, ISO, EN etc.
- Flame sensor technology with self-learning function for matrix-optimized sample decomposition
- Double furnace technology – vertical and horizontal mode in a single instrument
- Flow Management System for stable instrument performance and accurate analysis results
- Multi-purpose combustion tube for all standard applications
- Multi-matrix autosampler for the fully automatic determination of solid and liquid samples in vertical or horizontal furnace mode
- Application-optimized sampling systems for safe and reliable analysis of pressurized and non-pressurized gases and LPG samples
- Self Check System (SCS)

Overall Support

A global network of product, application and service specialists work hand-in-hand to help you fulfill your daily demands.

We support you with:

- Choosing the best technique and instrumental configuration for your application
- Setting up instrument, accessories and methods to your individual demands
- Offering ongoing support, training and service worldwide



Analytik Jena

Your Partner in Analytical Instrumentation



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Subjects to changes in design and scope of delivery as well as further technical development!

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