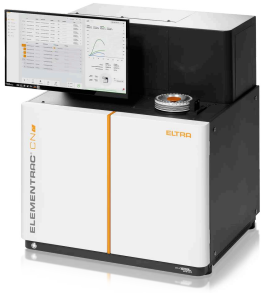
ELTRA®
a VERDER company

CARBON / NITROGEN / PROTEIN ANALYZER

ELEMENTRAC CN-r

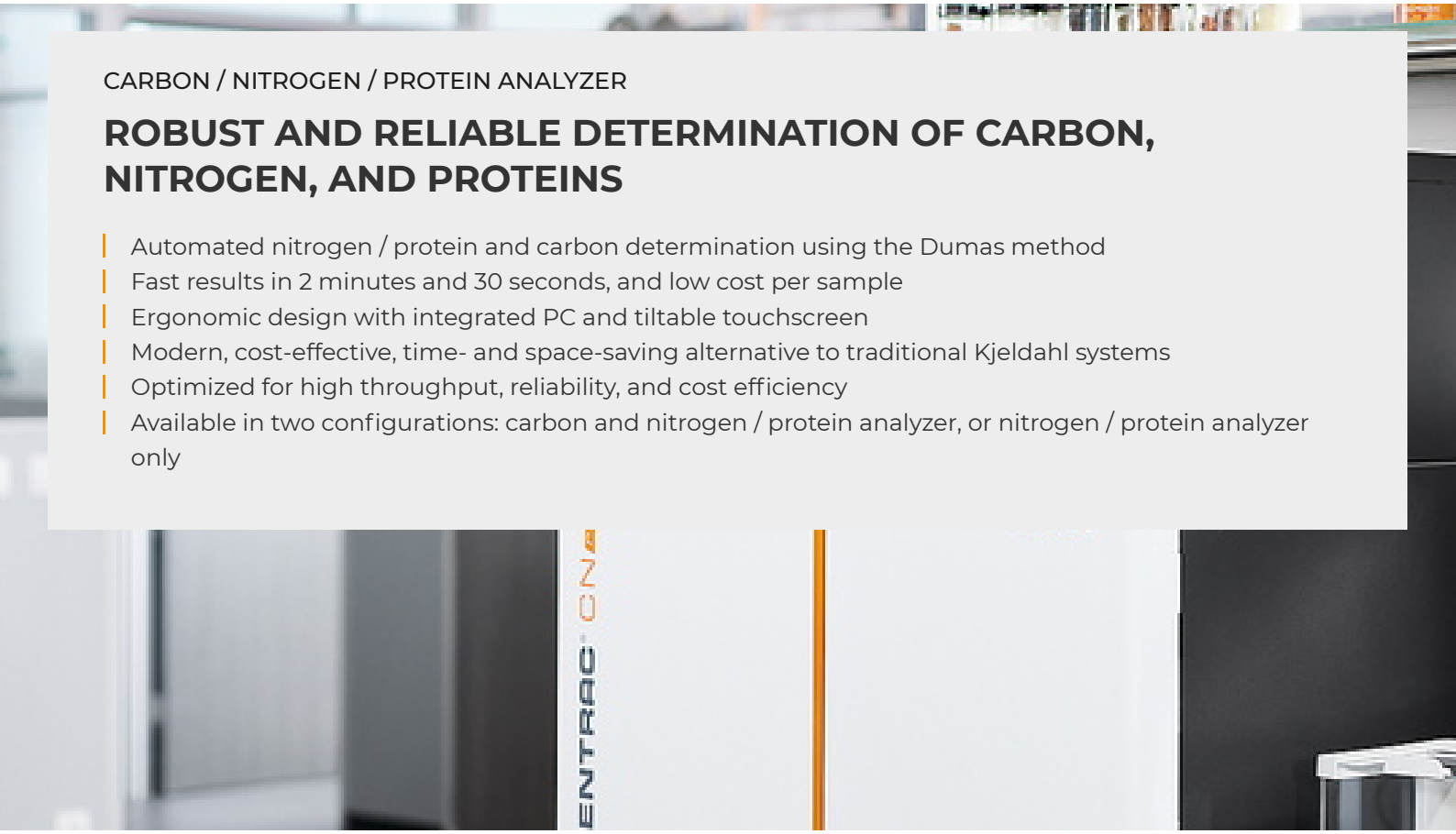
The ELEMENTRAC CN-r is the perfect solution for high-throughput laboratories needing fast and reliable nitrogen, protein, and carbon determination. This analysis method, known as Dumas analysis or the Dumas method, is a proven alternative to the traditional Kjeldahl method for determining total nitrogen and protein by combustion of the sample.



State-of-the-art hardware and an integrated PC with touchscreen allow the operator to monitor the process and control all parameters. The compact design of the ELEMENTRAC CN-r saves laboratory space. The use of non-aggressive chemicals ensures higher work safety compared to the Kjeldahl method.

Typical samples for the Dumas combustion analyzers are natural products of various compositions. The ELEMENTRAC CN-r ensures complete combustion analysis of all samples thanks to the use of a pure oxygen atmosphere during the process. Combined with the highly efficient, chromium-free catalyst, all components are fully oxidized. This prevents the formation of soot and liquid tin, contributing to the stability and accuracy of the results. Furthermore, method optimization is greatly simplified by the excess oxygen during combustion in the ELEMENTRAC CN-r.

The innovative autosampler of the ELEMENTRAC CN-r ensures clear sample identification, preventing mix-ups even in a busy laboratory environment and making it easier to handle a large number of samples.

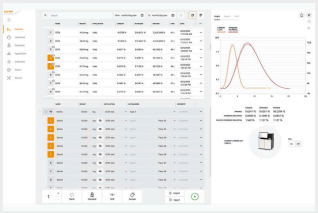


CARBON / NITROGEN / PROTEIN ANALYZER

ROBUST AND RELIABLE DETERMINATION OF CARBON, NITROGEN, AND PROTEINS

- Automated nitrogen / protein and carbon determination using the Dumas method
- Fast results in 2 minutes and 30 seconds, and low cost per sample
- Ergonomic design with integrated PC and tiltable touchscreen
- Modern, cost-effective, time- and space-saving alternative to traditional Kjeldahl systems
- Optimized for high throughput, reliability, and cost efficiency
- Available in two configurations: carbon and nitrogen / protein analyzer, or nitrogen / protein analyzer only

OPERATION AND ANALYSIS PROCESS



Step 1: Registration of the Sample in the Elements 4.0 Software

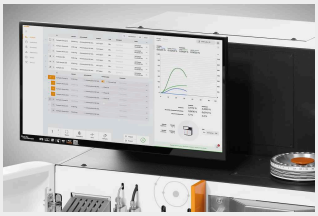
The sample is registered in the ELEMENTS 4.0 software. The weight is automatically transferred from the balance (step 1) – fast, safe, and error-free.

Step 2: Weighing and Application

Whether a few milligrams or up to 1 gram: the ELEMENTRAC CN-r offers the highest precision with various sample types – solid or liquid. These are simply weighed into tin foil or tin capsules and reliably analyzed.

Step 3: Analysis

The samples are conveniently placed into the carousel. The CN-r automatically detects the carousel and clearly assigns all samples – ensuring a smooth, safe, and automated process.



Step 4: Data output and export

120 to 180 seconds after the analysis has started, the measured concentrations are available for export as a report or via LIMS.

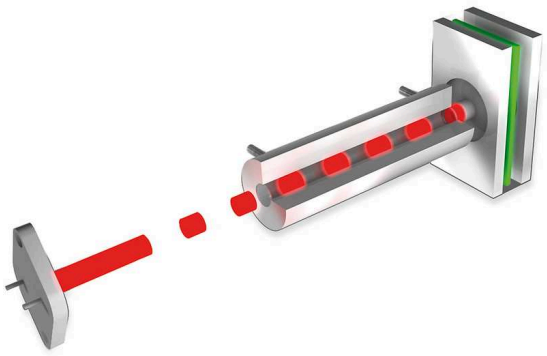
CONFIGURATIONS

The ELEMENTRAC CN-r can be flexibly configured:

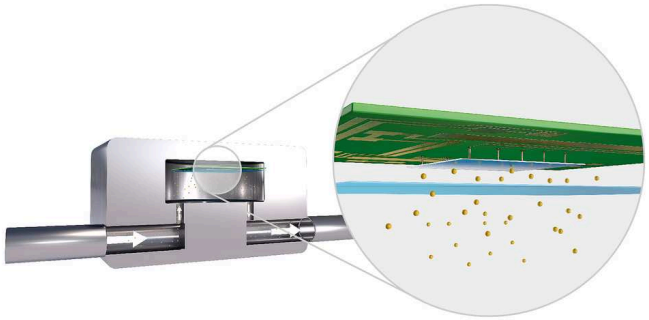
- Nitrogen/Protein determination
- Nitrogen/Protein and Carbon determination

While carbon is detected as CO_2, nitrogen determination is performed in elemental form using a highly sensitive thermal conductivity cell (TCD). Helium is used as the standard carrier gas (argon optional). This ensures maximum sensitivity in nitrogen analysis.

NON-DISPERSIVE INFRARED DETECTORS (NDIR)



THERMAL CONDUCTIVITY CELL WITH HIGH SENSITIVITY



INTEGRATED STANDARD SOLUTIONS

All chemicals required for operation are ergonomically arranged at the front and safely hidden behind a door during routine use. Maintenance is especially user-friendly: combustion and reduction tubes can be replaced without tools in just a few minutes. This well-thought-out design reduces time expenditure, increases reliability, and ensures maximum reproducibility of your analyses.

TOUCHSCREEN & INTEGRATED PC

The ELEMENTRAC CN-r is equipped with a modern touchscreen that can be placed flexibly either directly on the device or conveniently on the desk. Thanks to the integrated PC, no additional hardware is required. The ELEMENTS 4.0 software can be intuitively operated via touchscreen – or classically with a keyboard and mouse. With the available USB ports, you can easily connect peripheral devices such as a keyboard, mouse, or a balance.

NETWORKING & DATA ACCESS

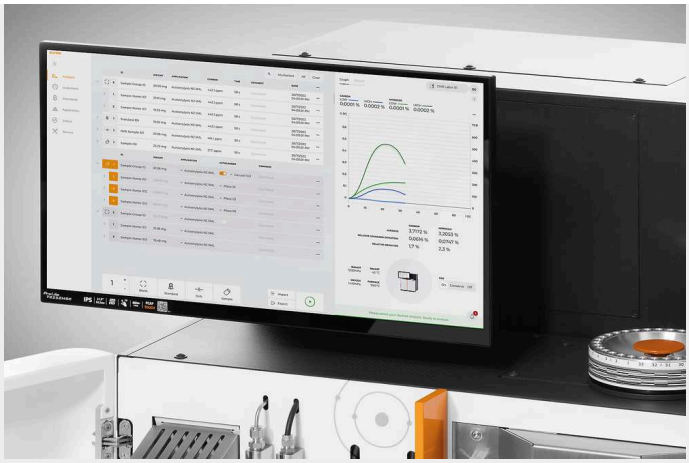
The CN-r can be easily integrated into your network. This allows you to transfer results directly into your LIMS or access the device software from your office PC. Whether recalculations, evaluations, or entering new samples: you always have full access and can complete your tasks easily and efficiently – regardless of the device's location.

HIGH PERFORMANCE

Analyze your samples in less than 3 minutes! Our intelligent processing allows simultaneous combustion of the current sample and analysis of the previous sample (so-called interleave analysis). Get results over 70 times faster than with the Kjeldahl method and benefit from unparalleled speed in your analysis workflow.

EFFORTLESS MAINTENANCE

All consumables can be replaced in less than 15 minutes, keeping your system always ready for use. An optimized workflow with quick and effortless maintenance ensures smooth operation with minimal downtime.



In addition to the features already integrated in the ELEMENTRAC CN-r, additional options are available to further enhance efficiency and extend the range of applications.

SOFTWARE

The comprehensive ELEMENTS software is an essential component of all elemental analyzers of the ELEMENTRAC generation.

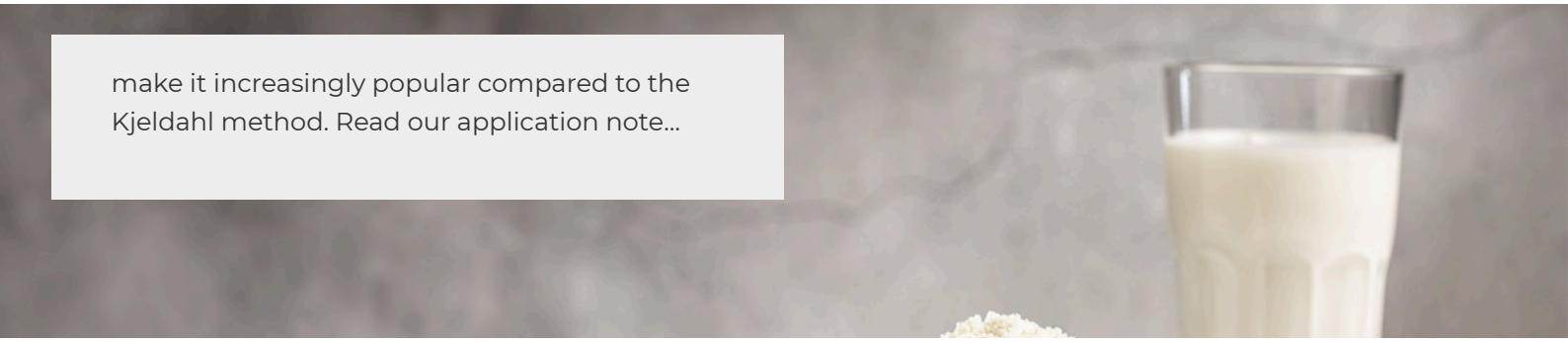
A central window (analysis and results) is the starting point from which all functionalities required for the daily routine are easily accessible. From here it is possible to group and export analyzed samples or to register and analyze new samples. The user can access various subordinate functionalities such as application settings, calibration, diagnostics, audit trail, user group management or status and is FDA 21 CFR Part 11 compliant.

In addition, thanks to the network integrity and web browser architecture, you can access the device from any computer in the company network and have all data available at any time.

APPLICATION NOTES

PROTEIN DETERMINATION IN MILK WITH DUMAS METHOD

The Dumas method is a valid alternative for determining protein content in milk, providing quick and accurate results without the use of harmful chemicals. Its efficiency and safety



make it increasingly popular compared to the Kjeldahl method. Read our application note...

TYPICAL SAMPLE MATERIALS

The Dumas method for protein and nitrogen determination is internationally recognized and validated by leading organizations such as AOAC, AACC, ISO, DIN, AOCS, and OIV.

RICE

- Determination of protein content for nutritional labeling and quality control
- Evaluation of rice by-products (bran, husks) for animal feed regarding nutrient composition
- Supporting breeding and research for improved rice varieties (higher protein content, better nutritional properties)

SOIL

- Soil samples to evaluate nitrogen availability for plants
- Fertilizers to determine nitrogen content and thereby fertilizer quality

MILK & DAIRY PRODUCTS

- Analysis of solid or liquid samples such as cheese, blue cheese, yogurt, and milk
- Determination of protein content for nutritional labeling and quality control
- The ELEMENTRAC CN-r meets or exceeds the requirements of all common international standards, such as DIN EN ISO 14891

MEAT & MEAT PRODUCTS

- Determination of protein content for nutritional labeling and quality control
- Verification of meat authenticity and prevention of food fraud
- Monitoring protein levels in processed meat products

COAL

- Measurement of nitrogen content to assess quality
- Control of nitrogen levels in coke production
- Optimization of combustion processes and reduction of emissions

FERTILIZERS

- Determination of nitrogen concentration to ensure fertilizer efficiency
- Quality control and compliance with agricultural standards
- Evaluation of nutrient availability for improved crop yield

GRAINS & OIL SEEDS

- Protein determination for nutritional evaluation and feed production
- Quality assessment in oilseed processing (soy, sunflower, rapeseed, etc.)
- Supporting research on oilseed breeding and agricultural development

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ELEMENTRAC CN-r

TECHNICAL DATA

Measurement ranges	Nitrogen: 0.03 mg to 300 mg Carbon: 0.02 mg to 175 mg
Typical weights	Bis zu 1,0 g, 0,5 g nominal
Analysis time	< 3 min
Detectors	Thermal conductivity detector (N) NDIR (C)
Typical samples	Food, feed stuff, fuels (coal and coke), environmental samples and fertilizers
Reagents	Magnesium perchlorate, sodium hydroxide, copper, aluminum oxide
Power supply	230 VAC ± 10 %, 50/60 Hz
Gas required	Oxygen (99.999% purity) Helium (99.996% purity) Compressed air (oil and water free)
Configurations	CN-r, N-r
Weight	135 kg
Dimensions (W x H x D)	(W x H x D) 75,7 x 78,5 x 62 cm

www.eltra.com/cn-r

ORDER DATA

ELEMENTRAC® CN-R

			Measuring range for 300 mg sample weight
88200-4000		CN-r	0.007 – 58.3 % C (0,02 – 175 mg C abs.) 0.01 – 100 % N (0,03 – 300 mg N abs.)
88200-4001		CN-r	0.01 – 100 % N (0,03 – 300 mg N abs.)

REQUIRED ACCESSORIES

	Linux based PC is already integrated, as well as 21,5 “ Touchscreen monitor
88400-0645	Balance (resolution 0.0001 g)

REQUIRED CONSUMABLES / CHEMICALS FOR FIRST OPERATIONS

88500-0021		CN-r / N-r Starting kit
90200		Anhydrone
90210		Sodium hydroxide

FURTHER OPTIONS AND CONSUMABLES

88400-0474		Tin foils, 36x36 mm, -HR-(200 pieces / packing unit)
88400-0640		Copper Turnings, 200 g
88400-0638		N Catalyst, 50 g
88400-0637		Large Ceramic Ash Crucibles-HR-(10 pieces / packing unit)
88400-0636		Copper sticks-HR-(100 g/packing unit)
88400-0635		Alumnium oxide pellets (Furnace reagent); 200 g
88400-0508		Steel wool, 454 g
90330		Quartz wool (50 g)

90332		Glas wool (50 g)
88400-0644		Tinfoil, 51x51 mm (200 pieces / packing unit)

FURTHER HARDWARE TOOLS (SPATULA, TONGUES)

88400-0229		Tweezers (160 mm), curved, 1 piece
88400-0472		Tweezers (145 mm), straight, 1 piece
88400-0475		Set with 6 spatula and 1 tweezers for multiple weighing procedures

TYPICAL SPARE PARTS

88400-0006		Reagent glass tube 20x280 mm
11064-3002		Reagent tube 305x20
40000-3512		Combustion tube

CALIBRATION MATERIALS

PRIMARY SUBSTANCES

90710-3010		EDTA, 50 g
90710-3030		Succrose
90810		Calcium carbonate

COAL PREMIUM

92550-3010		Specified for C;H;N;S ; TGA
92550-3020		Specified for C;H;N;S ; TGA

92550-3040		Specified for C;H;N;S ; TGA
92550-3060		Specified for C;H;N;S ; TGA

COKE PREMIUM		
92560-3010		Specified for C;H;N;S ; TGA

PET COKE PREMIUM	
92570-3020	Specified for C;H;N;S ; TGA
92570-3020	Specified for C;H;N;S ; TGA