

# vario EL cube



## The legend newly defined

vario EL is Elementar's most successful analyzer for the elements C, H, N, S, O and Cl. Based on a more than 100 years tradition in development, since 1992, over three generations, the vario EL sets the standards in elemental analysis.

The year 2008 marks a new milestone. With further improvements of the excellent analytical performance, an instrument was created based on the „cube“ platform with totally new concepts in microelectronics, mechanics and software.

The functional principle shows a true vario EL:

- Automatic sample feeding by the patented blank-free Heraeus inspired ball valve
- Combustion at 1200°C (temporarily 1800°C) with oxygen injection directly on the sample
- Reduction of NO<sub>x</sub> to N<sub>2</sub> on copper contact and removal of excess oxygen
- Separation of the gas mixture by specific adsorber columns for CO<sub>2</sub>, SO<sub>2</sub> and H<sub>2</sub>O
- Thermally controlled release of the individual gases and detection at a TCD
- Calculation of the element concentrations from detector signal and sample weight

### Even larger application range

In addition to CHNS and O also Cl can be detected by means of the new IR method. Automatic (or manual) direct syringe injection of liquid or gaseous samples is optionally available. Argon can also be used as an alternative carrier gas to helium.

### Even larger measuring range

50 mg organic sample material or 40 mg absolute C content can be analyzed.

### Even lower detection limits

The newly developed TCD allows measurements even below 40 ppm.

### Even more powerful automation

Fully automatic determination of up to 120 samples on a single level carousel with reduced measuring time.

### Even more user friendly

The new Windows® based software has all the features anyone could imagine.

### Even better applicable for IRMS coupling

Ideal for CNS and CHNS simultaneous isotope analysis; high temperature pyrolysis for O and H.

# vario EL cube

<b>Analysis method:</b>	High temperature combustion or pyrolysis of the sample and conversion of the elements into gaseous products.  Separation of the analysis gases and detection at a TCD (IR optional).
<b>Operating modes:</b>	CHNS, CHN, CNS, CN, N, S as standard with TCD, S, O, Cl with IR detection optional
<b>Digestion temperatures:</b>	adjustable up to 1200°C, for special applications also selectable up to 1400°C (by combustion of the tin vessels a temperature of approx. 1800°C is temporarily reached).
<b>Safety standards:</b>	CE-label, EN 61010-1, EMV low voltage directives 73/23/EEC
<b>Detection range*:</b>	C: 0-40 mg (or 100%)                      O: 0-2 mg N: 0-15 mg (or 100%)                      Cl: 0-2 mg H: 0-3 mg (or 100%) S: 0-6 mg (or 100%)
<b>Detection limit*:</b>	< 40 ppm with TCD 2 ppm with IR detection for S
<b>Standard deviation*:</b>	< 0.1% abs. (1-2 mg sulfanilic acid)
<b>Calibration:</b>	Multi point calibration, regression linear to the 4th order, stable over months.

## The power package for C, H, N, S, O, Cl

<b>Sample weight*:</b>	0.02 - 50 mg organic substance or up to 1 g soil sample.
<b>Analysis time*:</b>	self-optimizing depending on element content and sample weight  from N 3 min to CHNS 10 min
<b>Sample feeder:</b>	120 positions in a magazine as standard, optional 80 positions for larger samples reloadable any time during operation also direct syringe injection of liquids or gases optionally possible
<b>Gases:</b>	He: 99.995% purity                      3 l/analysis (alternatively Argon) O <sub>2</sub> : 99.995% purity                      0.05 l/analysis
<b>Instrument control:</b>	Operation and control via PC under Windows®; All instrument functions are digitally controllable, the possibility of remote control and diagnosis via the internet. In full compliance with 21 CFR Part 11 (option).
<b>Electrical connections:</b>	100/110/200/230 V, 50/60 Hz, 1,8 kW
<b>Dimensions:</b>	42 × 55 × 55 cm (W × D × H)
<b>Weight:</b>	approx. 65 kg

\* depending on sample type and analytical conditions