

# vario TOC select

*Enter the world of versatile TOC analysis*



High sensitivity



High data quality



Great flexibility



Extreme durability

vario TOC  select

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*Unmatched robustness  
and system uptime*

## KEY FEATURES

- Industry-leading performance and versatility
- Wide measuring range up to 100,000 ppm
- Economic electrochemical detection for  $TN_b$
- Automatic sample feeding for solids
- Unique matrix separation
- Outstanding robustness
- Integrated 50 position autosampler for liquids as standard

For over 30 years, Elementar has been the German pioneer in high temperature TOC analysis. Elementar's high temperature combustion method to measure organic contaminations provides a multitude of advantages compared to other methods.

It is optimized to deal with compounds hard to oxidize, such as humic acid or other rather persistent compounds. This always guarantees full recovery of every organic component and an outstanding precision and accuracy.

④ Clearly arranged and easily accessible components for fast and easy maintenance.

④ Optional autosampler for solid samples.



## *A workhorse for any laboratory*

The vario TOC select is designed for maximum robustness and minimal maintenance effort, thus providing industry-leading system uptime. The advanced matrix separation technology enables customers to run hundreds of samples without the necessity of maintenance work. For unattended overnight operation optional autosampler configurations with 60, 80 and 120 positions are available.

## *Unmatched analytical performance*

All parameters such as TOC, NPOC, TC, TIC, DOC, POC and  $TN_b$  can be measured with the same basic unit. Detection of ppb level, undiluted 100,000 ppm industrial waste water or up to 20 mg C absolute in solids represents a measuring range which cannot be met by any other instrument. Sample volume can range from 3  $\mu$ l to 2 ml. No modifications of the instrument hardware or detection range is necessary.

## *No limitations in sample nature*

The vario TOC select has an optimized tubing and connection system that gives rise to reliably, trouble-free handling of liquid samples containing particles. With the unique matrix separation concept, concentrated salt solutions can be analyzed even in larger injection volumes. In addition, the vario TOC select is one of the very few analyzers on the market that allows measurement of solid and liquid samples with a single instrument – retrofitting is done within minutes.

## *NDIR detection of the next generation*

A completely new high performance detector for  $CO_2$  is used in the vario TOC select. The actual realization of the non dispersive infrared (NDIR) principle means a minimization of spectral interferences and a vastly low-noise characteristic. A dynamic detection range for TOC from ppb into the percentage range is achieved by the 24 bit digital resolution of the measuring signal without the need for measuring range gain adjustments. A unique feature is the possibility to also measure  $TN_b$  by means of NDIR detection.

### TOTAL ORGANIC CARBON



The measuring principle is based on the high temperature digestion of the sample in an air /  $O_2$  stream at 850 °C. Totally bound carbon is converted into  $CO_2$  which is quantitatively determined by means of a NDIR detector. The advantage of this method as opposed to the wet chemical UV / persulfate digestion is the absolute assurance that even stable compounds, particles or salt containing solutions will be completely detected. Additionally, the high temperature method enables the determination of bound nitrogen ( $TN_b$ ).

### HIGH TEMPERATURE DIGESTION



A high combustion temperature is crucial for a quantitative oxidation of bound carbon to  $CO_2$  and a precondition for the digestion of stable compounds and particles. The vario TOC select can be operated at a permanent furnace temperature of up to 1200 °C. In solids mode the combustion enthalpy of the tin capsules results in a temporary temperature increase of up to 1800 °C. This allows the analysis of even refractory samples.

# TOC / TN<sub>b</sub> analysis has never been easier!

SAMPLE	TOC [mg/l]	RSD [%]	TN <sub>b</sub> [mg/l]	RSD [%]
MUNICIPAL WASTE WATER INFLUENT	131	1.6	36.8	1.5
MUNICIPAL WASTE WATER EFFLUENT	6.18	1.8	13.7	1.3
INDUSTRIAL WASTE WATER INFLUENT	458	0.88	54.8	5.4
INDUSTRIAL WASTE WATER EFFLUENT	34.9	0.52	25.5	6.8
DRINKING WATER	0.92	2.9	-	-
MIXED WASTE*	54.4 w-%	5	-	-
MINERAL (SCHEELIT)*	1.26 w-%	0.49	-	-

\*Solids measurements

## IN ACCORDANCE WITH THE OFFICIAL STANDARDS

The vario TOC select operates in full compliance with all relevant national and international norms or standards like ISO 8245, 10694, EPA 415.1, European standard acc. to EN 1484, ENV 12260.

## QUALITY YOU CAN TRUST

Our consumables and spare parts are designed to meet the highest quality standards and reliability. They are certified and validated in accordance with international norms and standards. We do not compromise on quality of our parts and chemicals – this is the prerequisite of a guaranteed long lifetime of our instruments.

## EASE OF USE

The vario TOC select is optimized to significantly simplify the daily routine operation. Clearly arranged, easily accessible system components minimize maintenance efforts. The tool-free clamp connection system ensures a reliably leak-tight instrument at any time. Thus, customers can enjoy smooth analyses and confidence in their results.

## IDEAL SOLUTION FOR

- Environmental laboratories
- Academic research groups
- Quality control laboratories

## SAMPLE TYPES ANALYZED

- Tap water
- Drinking water
- Surface water
- Waste water (influent, effluent)
- Waste
- Soil



### High sensitivity

Outstanding sensitivity thanks to high performance, state-of-the-art technology.



### High data quality

Outstanding precision and accuracy through high performance combustion. Matrix-independent results. Longterm stability of calibration.



### Great flexibility

Wide range of optional conversion kits available for special applications. Upgradeable at any time.



### Extreme durability

Outstanding robustness and longevity thanks to state-of-the-art technology. 10 year warranty on the furnace.

## Elementar – your partner for elemental analysis

Elementar is the world leader in high performance analysis of organic elements. Continuous innovation, creative solutions and comprehensive support form the foundation of the Elementar brand, ensuring our products continue to advance science across agriculture, chemical, environmental, energy, materials and forensics markets in more than 80 countries.

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