LAR
PROCESS ANALYSERS AG

QuickTOC ultra

TOC-ANALYSIS

Online TRUE TOC for every kind of water. Especially for the tough stuff.

Fast. Precise. Reliable.

По вопросам продаж и поддержки обращайтесь:

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Единый адрес: mra@nt-rt.ru | http://lar.nt-rt.ru

APPLIED TOC THEORY.

Whether you're measuring emulsified water from a flavoring production plant, industrial wastewater in an aeration basin or the wastewater from a dairy, paper or paint factory: The QuickTOC$_{ultra}$ can measure organic loads in water for a broad range of applications.

Aqueous streams are monitored to assure environmentally compliant discharge, to control product quality and operational costs. Through continuous monitoring, industrial processors are able to detect and reduce product loss.

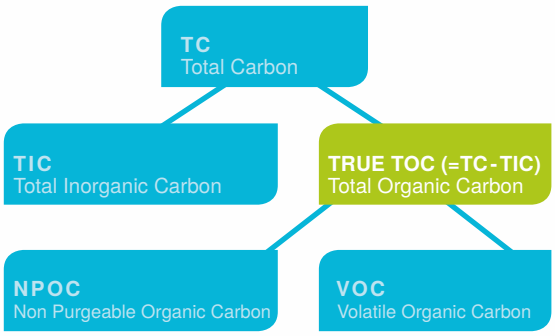


Fig. 1

Clumps, algae and slime.

Unlike many systems, the QuickTOC$_{ultra}$ works continuously and reliable, even in the presence of coarse materials and even high salt concentrations with no increased maintenance requirements.

What is TOC and how is it measured.

Many organic compounds cannot be quantified individually without costly, time-consuming analysis. As an alternative, Total Organic Carbon (TOC) summarizes a sample's organic load as an indicator of water quality.

TOC is best detected through the difference method. Combustion at 1200°C breaks all organic and inorganic carbon bonds, producing CO_2 which is detected and quantified. As intermediate values, the Total Carbon (TC) and the Total Inorganic Carbon (TIC) are determined. The TIC value is subtracted from the TC value, resulting in the Total Organic Carbon, (TOC) (Fig.1).

Exact 1200°C Analysis provides the TRUE TOC

For an exact TOC measurement all carbon bonds must be completely broken, and carbonates only break fully at temperatures over 1150°C. Therefore, measurements at lower temperatures deliver less exact results.

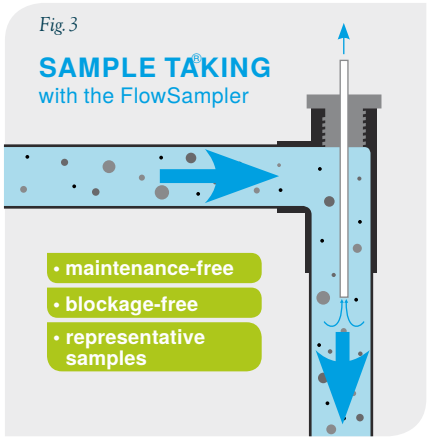
No Catalysts.

Catalysts are only necessary for lower range "high temperature" oxidation (680 – 1,100°C) to help oxidize the carbon bonds. But catalyst performance lowers over time, affecting the measurement results, necessitating re-calibration and eventually requiring catalyst replacement.

Direct method: an inexact alternative.

In contrast to the difference method, the direct method does not detect the complete TOC. Instead, using an acid the inorganic carbon (TIC) is removed from the sample prior to combustion. The problem? The volatile organic carbon (VOC) is also expelled. Thus, after combustion only the non-purgeable organic carbon (NPOC) value can be calculated. Meaning that VOCs, a component of TOC, remains undetected.

Fig. 3



FlowSampler®

Maintenance-free / non-fouling

LAR's unique sampling method helps assure uninterrupted operation.

With LAR's patented FlowSampler® a stainless steel tube is centered in a pipe and draws the sample against the flow of the stream and into the analyzer. The flow velocity carries large and small solid particles past the sample tube. All other particles, even solid particles, are sampled and correspond 98% with that of a grab sample. The sampling method is maintenance-free. These results cannot be reached with any kind of filter or sieve.

Robotic injection for a perfect dose.

Inside the analyzer, the samples are kept homogeneous in collection vessels. An automated needle draws an exact dose and injects it into the oven through a valve which ensures that the oven (Fig. 2) remains sealed from the ambient air. After each injection, the needle is automatically rinsed and cleaned.

THE ANALYZER.

A hot oven: Where temperature makes the difference.

MEASUREMENT PRINCIPLE
of the QuickTOCultra

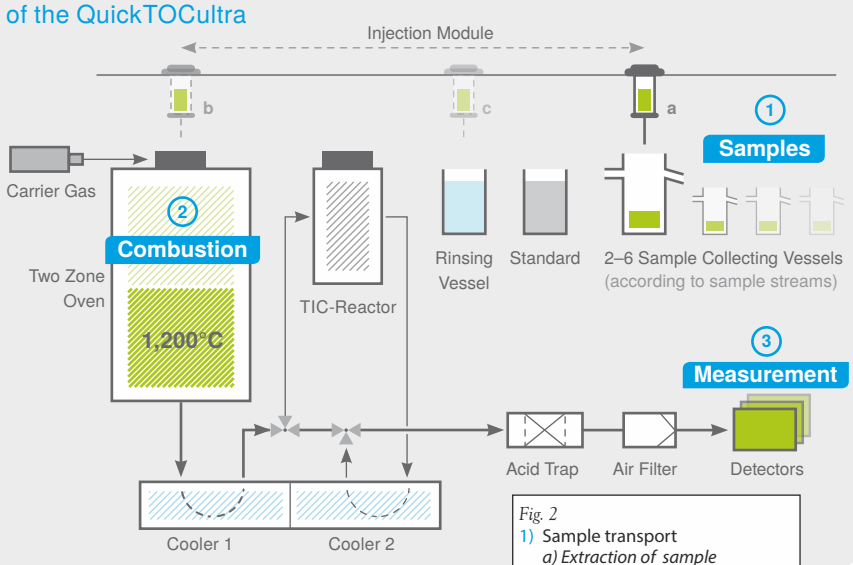


Fig. 2
1) Sample transport
a) Extraction of sample
b) Injection through valve
c) Rinse injection needle.
2) Combustion, oxidation to CO_2
3) CO_2 measurement

Warm, warmer, hot.
The ceramic oven is at the heart of the QuickTOC$_{ultra}$, breaking all carbon bonds at 1200°C, and providing a complete, catalyst-free sample analysis.

Tailor-made Instruments.
Modular and flexible, the QuickTOC$_{ultra}$ can measure up to six different sample streams and is configurable for additional detectors to add TN_b and COD alongside TOC. A variety of housings enables the analyzer to be installed safely, even in explosive environments.

The QuickTOC$_{ultra}$ can be configured to prepare its own carrier gas. Thus, requiring no external gas supply.

UltraQuick.
Since cycles run in less than 3 minutes, short events can be captured that might otherwise be missed. Maintenance is fast too, at less than 30 minutes per week, so the analyzer's availability is over 98%. All areas of the analyzer have been designed for easy maintenance: from filter-less sample extraction (Fig. 3), to the oven's removable foot for quick salt residue removal.

High salts are no problem.
Unlike most TOC analyzers, the QuickTOC$_{ultra}$ can handle salt concentrations up to 100 g/L. Our extra-high salt option can handle up to 300 g/L sodium chloride (NaCl). No need to dilute, so samples remain pure and the measurement remains accurate.

LAR's high temperature process enables salts to be easily discharged. They move through the oven in fluid form and are eventually carried out by the carrier gas and deposited in a retaining device, from which they can be easily and quickly removed. So no salt deposits can form in the oven.

Secure - you decide who does what.
Through two separately programmable user-access levels, you can assign access rights to individual operators. Optionally, the analyzer can be controlled remotely using a networked PC.

CO_2 detection. Reliable and simple.
The gas that is produced by the combustion condenses in the cooler. The remaining gas is purified by a filter before its CO_2 concentration is determined by the detector.

Without TIC no TRUE TOC.
In the second reactor the inorganic compounds are purged out of the sample with acid. The combustion gas is again cooled and filtered and the CO_2 concentration is measured. The TIC value is subtracted from the total carbon (TC), determining the total organic carbon, the TRUE TOC.

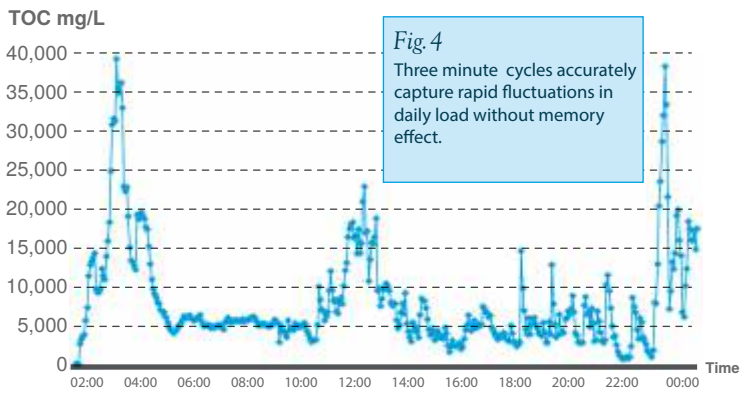


Fig. 4
Three minute cycles accurately capture rapid fluctuations in daily load without memory effect.

QuickTOC ultra

TECHNICAL DATA

Measurement Technique and Sample Preparation	
Method	Thermal oxidation
Ranges	0.1–200 mg/l, 5–4,000 mg/L 100–50,000 mg/L TOC, others available
Response Time	3 minutes (TOC)
Sample Prep.	Maintenance-free particle cutter Optional homogenizer for continuous sample homogenization
Dimensions and Weight	
Housing	Steel IP 54
Options	Stainless steel, IP 65, ATEX Zone 1 and 2 for T3, T4 classes
Dimensions	700 x 1020 x 520 mm (W x H x D)
Weight	115 kg
Electric and Hydraulic Specifications	
Inflow & Outflow	Tube 30 mm ID or screw thread connection DN 25
Auxiliary Energy	230 /115 V, ~50 / 60 Hz
Analog Output	0/4– 20 mA
Serial Interface	RS 232 for remote control (option)
Safety	2/6 A internal, 16 A external
Remote Control	Through TCP/IP Protocol (Internet)
Equipment Devices and Data Output	
Display: High res. 10.4-inch backlit LCD touch screen	
Autostart function	
Self explanatory software	
Data Interface: USB	

With the QuickTOCultra the electronics are isolated from the analytics to prevent damage and cross-contamination.

All compartments are easily accessible.

TÜV certified company

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