



QuickTOC_{UV}

TOC-ANALYSIS

The continuous TOC monitoring system.
Protecting clean water from organic contaminants.

Fast. Reliable. Compact.



A MEASURING SYSTEM FOR CLEAN AND PURE WATER.

Organic contaminants can be rapidly and economically analyzed with the right measuring system, even in pure water such as condensate return or boiler feed water.



The QuickTOC_{uv} is suitable for the determination of TOC in ultra-pure water (i.e. condensate, condensate return, boiler feed water) - especially in the petrochemical and chemical industries, as well as in refineries. Surface water and drinking water can also be monitored reliably.

Continuous, cost-effective monitoring helps to protect pure and ultrapure water against contamination from leaks and spills, ensuring safe plant operation.

Ultrapure water.

High demand, high potential savings.

Industry uses ultrapure water in boiler-feed, cooling water, condensate return, make-up water and more.

Petroleum and chemical refineries in particular require large quantities of expensive purified water. Recycling process water and its thermal energy provides savings, but only if the water complies with purity requirements.

Organic impurities cause deposits in pipes, corrosion in boilers, damage to heat exchangers or even failure of an entire plant. Continuous process monitoring safeguards plant operation.

How TOC is measured.

In most cases, it's impossible to determine each organic compound that can occur in water. However, since

all living organisms contain carbon the total organic load can be summarized by oxidizing a sample, converting organics to CO₂ then quantifying the organics as Total Organic Carbon (TOC).

QuickTOC_{uv} convinces with its ease of use, low investment costs and high operational safety.

Photochemical oxidation using UV light.

In this procedure, TOC is oxidized using UV light and a digestion reagent (sodium persulphate). The generated CO₂ is then measured by a non-dispersive infra-red (NDIR) detector.

A method for drinking & surface water.

The procedure is recommended, in particular, for particle-free process water and for monitoring drinking and surface water, as not all particles can be fully oxidized by photochemical oxidation.

Advantages of Rapid TC.

In the boiler, inorganic carbon can produce carbonic acid and other compounds that damage equipment. Continuous monitoring of total carbon (TC) and volatile organic compounds (VOCs) helps to safeguard operations.

QuickTOC_{uv}. User-friendly.

LAR's QuickTOC_{uv} can be run in TOC or TC mode and optionally monitors two parallel sample streams. The clear, compact measuring system complies with common safety standards and is designed for low-maintenance and ease of use. The large glass door provides visual confirmation of operation.

The QuickTOC_{uv} is fast and easy to use thanks to its large display. Measurements can be displayed in addition to the current value and the status of the device. Auto-calibration and automatic system checks minimize service and assure safety, reliability and precision.

Composition of the parameters.

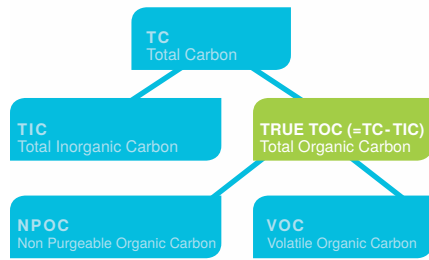


Fig.1

AT A GLANCE

- Continuous monitoring assures the quality of pure or ultrapure water.
- Organic contaminants in drinking and surface water are easily detected through continuously online monitored.
- TOC indicates the organic load in the sample.
- Continuous TOC monitoring helps to protect Process equipment.
- The QuickTOC_{UV} has been designed to be particularly low-maintenance- and user-friendly.

THE ANALYZER. Shedding light on organic contamination.

Continuous TOC measurement.

- UV Persulphate Method
- Online TC and TOC
- DIN EN 1484:1997 and US-EPA 415.2

Wear & tear resistant reactor.

- Protects operators from UV rays
- Internal quartz glass tube protects the UV lamp from contact with sample
- Over two years of safe operation

Simple, fast operation & maintenance.

- Minimum chemical requirements
- Minimum service tasks
- Uptime of over 98%

Reliable technology.

- Optional second stream
- Optional carrier gas preparation
- Wet chemistry separated from electronics.

Software and operation

- Automatically re-zeros NDIR detector
- Touch-screen interface
- 24-hour curves or tables
- Stores results and calibration data

Custom housing options.

- Internationally certified
- Ex-proof compliant for zones 1 and 2
- Pressurized encapsulation available

THE PRINCIPLE. Getting the most from the UV persulphate method

The UV persulphate method.

The oxidant sodium persulphate (Na₂S₂O₈) is added to the sample then exposed to a strong UV light, resulting in hydroxyl radicals that convert any organic carbon present into CO₂ which is measured and quantified using an NDIR detector.

TOC direct or TC method.

The TOC-direct method strips inorganic compounds (IC) before oxidation, so that only organic compounds are digested within the uv-reactor.

Alternatively, the TC method dispenses with the initial stripping, and measures the entire carbon content, including TIC and possible VOC/ POC.

The procedure. Three steps.

First, a pH 2 acid sparge removes any inorganic carbon as CO₂. The sample now contains only NPOC.

The sample is continuously fed into the UV reactor with sodium persulphate digestion reagent and carrier gas. UV exposure produces hydroxyl radicals that convert the organic carbon to CO₂.

The carrier gas is dried and fed into the NDIR detector where the CO₂ is quantified.

MEASUREMENT PRINCIPLE of QuickTOC_{UV}

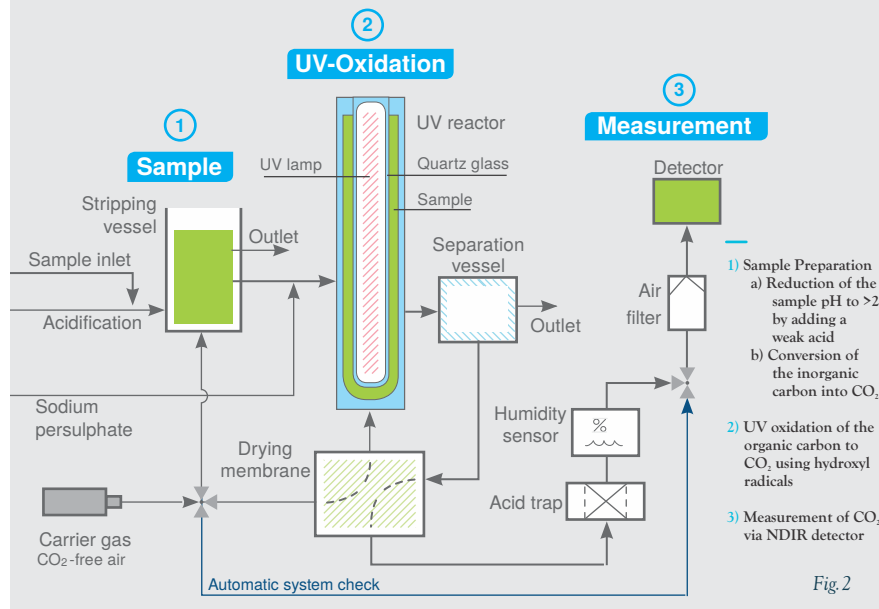
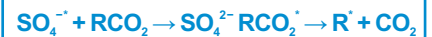


Fig.2

HYDROXYL RADICALS



Free radicals (*) are produced in UV light.

The sulphate anion radical produces hydroxyl radicals (*OH) with water.

These react with organic compounds forming carbon dioxide and water.

QuickTOC_{UV}

Online TOC measurement - the easy way to analyze pure water.

The QuickTOC_{UV}, manufactured by LAR Process Analysers, is a measuring device for continuous online determination of total carbon (TC) and total organic carbon (TOC) in pure water, e.g. condensate return and boiler feed water.

QuickTOC_{UV} can also be supplied with ex-proof housing (pressurized encapsulation).

Additional safety cabins can be dispensed with thanks to the internationally certified housing.



FEATURES & BENEFITS

- ✓ Recognized UV persulphate method
- ✓ Continuous determination of TOC, TC, NPOC, DOC
- ✓ Accuracy of $\pm 2\%$
- ✓ Auto-calibration
- ✓ Automatic System check (zero-point correction, sensitivity)
- ✓ Reduced Consumption of chemicals
- ✓ Certified housing for EX zones (EX p) (options for ATEX, IECEx, etc.)
- ✓ Analyzer availability of minimum 98%
- ✓ Maintenance and service maximum of 15 minutes per week
- ✓ Very low operating & maintenance costs

TECHNICAL DATA

Measurement Technique and Sample Preparation

Method	UV persulphate oxidation
Ranges (mg/L)	0.1–1, 0.5–10, 1–50, 10–100, 50–500, 100–1000, others on request
Response Time	<5 minutes (T90)
Parameter(s)	TOC, NPOC, TC, DOC
Sample Streams	1 or 2 (optional)
Sample Preparation	Overflow vessel (optional)

Dimensions and Weight

Housing	Steel IP 54, powder coated
Options	Stainless steel, IP 65, (NEMA 4X), EXp Zone 1 and 2 (Atex, IECEx)
Dimensions	W ~23.6 x H 30 x D 15.63 inches (W 600 x H 762 x D 397 mm)
Weight	99.2 Lb. (45 kg)

Electric and Hydraulic Specifications

Inflow & Outflow	Tube 6mm ID (~1/4 in.) & 8mm ID (~5/16)
Power Supply	230 / 115 V, ~50 / 60 Hz
Analog Output	0/4– 20 mA
Serial Interface	RS 232, collective alarm, life-zero, USB
Safety	2/6 A internal, 16 A external
Remote Control	Through TCP/IP Internet Protocol (optional)

Equipment Devices and Data Output

Display:	High res. 8.4-in. backlit LCD touch screen
Autostart function	
Self-explanatory software	
Automatic system check	



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