

## COD in Waste Water

Pollution-free  
High Oxidation

### On-line COD - High Temperature Method

LAR's **QuickCOD<sub>o</sub>** and **QuickCOD<sub>i</sub>** provide discontinuous, automatic measurement of the COD by thermal combustion in waste or process water streams delivering fast and accurate results.



#### QuickCOD<sub>o</sub>

- ▶ COD: 10 – 200 000 mg/l
- ▶ Response time: 3 min
- ▶ High-temperature at 1200°C
- ▶ Complete oxidation
- ▶ Reagent-free analysis
- ▶ No correlation
- ▶ No memory effects
- ▶ Combination with TN<sub>o</sub>
- ▶ **FlowSampler**® optional

#### QuickCOD<sub>i</sub>

- ▶ COD: 1 – 150 000 mg/l
- ▶ Response time: 3 min
- ▶ Reagent-free analysis
- ▶ High-temperature at 1200°C
- ▶ TOC/ COD correlation

#### ▶ Applications

- ▶ Plant effluent monitoring
- ▶ WWTP influent
- ▶ WWTP effluent
- ▶ Detection of organic spills
- ▶ Product loss
- ▶ TOC/ TC/ COD
- ▶ No memory effects
- ▶ Combination with TN<sub>o</sub>
- ▶ **FlowSampler**® optional

Combined with low costs of ownership these analysers are ideal for environmental compliance or monitoring of product losses and process efficiency.

### Fast and Simple COD analysis

#### Elox100®

- ▶ COD: 1 - 100 000 mg/l
- ▶ Response time: < 4 min
- ▶ Easy to maintain and operate
- ▶ High oxidation potential
- ▶ Electrochemical oxidation
- ▶ No memory effects
- ▶ No chloride disturbances
- ▶ **FlowSampler**® option



This pollution-free measurement method reduces drastically the maintenance expenses. No storage and disposal of reagents as well as handling with hazardous chemicals is necessary.

### Water ■ Waste Water ■ Industries

LAR's online monitors deliver outstanding performances to meet regulatory requirements and optimise waste water treatment processes for a wide range of applications:

#### ▶ Industries

- ▶ Pulp & Paper
- ▶ Chemical
- ▶ Petrochemical
- ▶ Food & Beverage
- ▶ Municipal & Industrial Treatment
- ▶ Pharmaceutical
- ▶ Breweries
- ▶ Environmental
- ▶ Power Plants
- ▶ Refineries
- ▶ Automobile

#### ▶ Applications

- ▶ Condensate
- ▶ Boiler Feed Water
- ▶ Surface Water
- ▶ Drinking Water
- ▶ Process Water
- ▶ WWTP Influent
- ▶ WWTP Effluent
- ▶ Cooling Water
- ▶ Airport Deicing
- ▶ Pure Water
- ▶ HPW
- ▶ WFI



LAR AG/Flyer/env301/EU

# The TOC Company

# LAR

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Product Overview

## TOC in Waste Water

Highest Solid Concentrations  
Highest Salt Concentrations

## TOC in Ultra Pure Water

High Sensitivity  
Easy Calibration

## Effluent

Drinking Water  
Surface Water

## Respiration in Water

Toxicity  
BOD

### The Ultimate Solution for Waste Water

LAR's **QuickTOC**® is the on-line true TOC system for the determination of total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and dissolved organic carbon (DOC) suitable even for the most difficult waste water applications.



#### QuickTOC®

- ▶ TOC: 0.1 - 50000 mg/l
- ▶ Response time: 3 min
- ▶ Combustion at 1200°C
- ▶ TOC/ TC/ TIC
- ▶ Salt concentrations >10%
- ▶ Measurement of complete samples incl. solids/ particles
- ▶ No filtration necessary
- ▶ No memory effects
- ▶ Low maintenance cost
- ▶ Optional combination with TN<sub>b</sub>
- ▶ **FlowSampler**® option

The high temperature method with combustion at 1200°C guarantees the complete oxidation of the sample.

#### ▶ Applications

- ▶ Plant effluent monitoring
- ▶ WWTP influent
- ▶ WWTP effluent
- ▶ Detection of organic spills
- ▶ Product loss

LAR's unique robot system is capable of transporting and measuring highest contents of solid matters without any filtration of the sample.

LAR's QuickTOC® is available with various housings for corrosion and explosion protection:

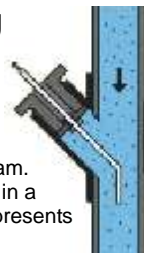
- ▶ IP54 (Standard)
- ▶ Nema 4x (purgeable)
- ▶ ATEX Zone I
- ▶ ATEX Zone II



### Patented Blocking-Free Sampling

#### FlowSampler®

This filtration-free, patented sample preparation system works by drawing the sample, „against the flow“, from the center of a fast flowing sample stream. The sample is being continuously stirred to keep it in a homogenised and representative state. Thus, it represents 98% or more of the total sample stream.



### The Customized Solutions for Pure Water

With these specialised on-line TOC analysers for industrial applications LAR provides highly sensitive, automatic determination of the true TOC in pure water samples.



#### ▶ Common Features

- ▶ Combustion at 1200°C
- ▶ Simple calibration
- ▶ TOC/ TC determination
- ▶ Combination with TN<sub>b</sub>
- ▶ Fast response time
- ▶ High sensitivity
- ▶ No memory effects
- ▶ Low maintenance cost

#### QuickTOC<sub>purity</sub>

- ▶ 0 - 2000 µg/l TOC
- ▶ 0.1 - 10 mg/l TOC
- ▶ Process water

#### QuickTOC<sub>condensate</sub>

- ▶ 0 - 2000 µg/l TOC
- ▶ 0.1 - 10 mg/l TOC
- ▶ Samples up to 90°C
- ▶ Condensate return
- ▶ Boiler feed water

#### QuickTOC<sub>pharma</sub>

- ▶ 0 - 1000 µg/l TOC
- ▶ Highly purified water
- ▶ Water for injections

The patented calibration simplifies the calibration and validation. No laboratory standards are needed.

The calibration can be effected via remote control at any time.

The fast and sensitive detectors enable a prompt reaction in process control, such as diversion of contaminated streams.

### TOC by UV - The Economical Solution

#### QuickTOC<sub>uv</sub>

- ▶ TOC: 0 - 20 mg/l
- ▶ TOC: 0 - 100 mg/l
- ▶ TOC: 0 - 2000 µg/l

- ▶ UV-oxidation
- ▶ Potassium peroxodisulfate
- ▶ Continuous measurement
- ▶ Very fast response time
- ▶ Low maintenance cost

LAR's **QuickTOC<sub>uv</sub>** provides precise continuous TOC/ DOC analyses for ultra pure and clean water applications being a reliable solution at low cost.



### 4 in 1 - Simultaneous Determinations

- ▶ Total Organic Carbon (TOC)
- ▶ Total Phosphor (TP)
- ▶ Total bound Nitrogen (TN<sub>b</sub>)
- ▶ Chemical Oxygen Demand (COD)



#### QuickTOC<sub>NPO</sub>

- ▶ TOC: 0.1 - 200 mg/l
- ▶ TN<sub>b</sub>: 0.1 - 50 mg/l
- ▶ TP: 0.01 - 4 mg/l
- ▶ COD: 1 - 600 mg/l

- ▶ Complete oxidation at 1200°C
- ▶ No memory effects
- ▶ Determination of all 4 parameters at the same time
- ▶ Combinations of 2 or 3 parameters obtainable
- ▶ Single parameter determination available

#### ▶ Applications

- ▶ Process control
- ▶ WWTP control
- ▶ Surface water monitoring

LAR's **QuickTOC<sub>NPO</sub>** provides automatic, reagent-free, and simultaneous determinations of up to 4 parameters. This system delivers continuous output of results for monitoring and controlling of any water with lower particle density such as effluent, drinking and surface water.

### Effluent - Drinking Water - Surface Water TOC and COD Determinations

#### QuickTOC<sub>effluent</sub>

- ▶ TOC: 0.1 - 200 mg/l

- ▶ Combustion at 1200°C
- ▶ TOC/ TC determination
- ▶ Insensitive to sludge overflow
- ▶ No memory effects
- ▶ Low maintenance cost

#### QuickCOD<sub>effluent</sub>

- ▶ COD: 1 - 600 mg/l

- ▶ Combustion at 1200°C
- ▶ TOC/ TC determination
- ▶ Insensitive to sludge overflow
- ▶ No memory effects
- ▶ Low maintenance cost

LAR's **QuickTOC<sub>effluent</sub>** and **QuickCOD<sub>effluent</sub>** provide continuous output of results for monitoring and controlling of effluent streams in municipal and industrial WWTP, drinking water supply industry as well as surface water in environmental protection.

### On-line Toxicity at any Time



#### Nitritox®

- ▶ Toxicity: 0-100%
- ▶ Response time: < 5 min.
- ▶ Toxicity monitoring
- ▶ Self-regenerating culture of nitrifying bacteria
- ▶ Highest sensitivity
- ▶ No memory effects
- ▶ Low operation cost
- ▶ Option: **FlowSampler**®

#### ▶ Applications

- ▶ Surface Water Monitoring
- ▶ Drinking Water Protection
- ▶ WWTP Protection

LAR's **Nitritox**® measures toxicity against sensitive nitrifying bacteria.

These self-regenerating bacteria are cultivated within the analyser without having to pay special attention to its age or breed. For every test a small portion of this culture is used.

By monitoring the respiration inhibition of the bacteria, the **Nitritox** provides most reliable results without any risk of memory effects or other distortions. This continuous and automatic on-line measurement system has a measurement cycle of less than 5 minutes.

Thus, operators can react promptly to any toxic events.

### On-line BOD - Respiration - Toxicity

#### BioMonitor®

- ▶ BOD: 1 - 200000 mg/l
- ▶ Toxicity: 0 - 100%
- ▶ Respiration in mg/l
- ▶ High degradation
- ▶ Response time 3 - 4 min. (customizable)
- ▶ Sludge activity
- ▶ No memory effects
- ▶ Optional **FlowSampler**®



LAR's **BioMonitor**® determines respiration, BOD or toxicity on-line.

#### ▶ Applications

- ▶ Environmental protection
- ▶ BOD monitoring
- ▶ WWTP control

Using the plant's own biomass and sample stream, the 4-vessel cascade reactor corresponds to a WWTP.

The response time is free adjustable to the application allowing immediate reactions.