

Technical Data

Measurement and Sample Preparation

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|---------------------|--|
| Measuring method: | thermal combustion $\geq 1,200^\circ$ CO ₂ detection with NDIR TC/TOCdirect |
| Measuring range: | 20 - 2,000 ppb 0,1 - 10/20 ppm |
| Time lag: | 2 - 5 min.(application dependent) |
| Reproducibility: | 2% oder ± 10 ppb |
| Accuracy: | $\pm 2\%$ of FS or ± 10 ppb |
| Sample temperature: | max. 40°C ; max. 95°C (optional) |

Operation and Data Output

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| Graphic-LCD-screen, high resolution, back lit |
| Autostart-function |
| Self-explanatory software with integrated help system |
| Standard data interface to office PC |

Hydraulic and elektrical Connections

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|---------------------|---|
| Sample Water in: | stainless steel tube OD 6mm (Swagelok) |
| Sample Water drain: | PVC tube OD 8mm |
| Electrical Power: | ~115 / 230V, 50 / 60 Hz |
| Analog output: | 0/4-20 mA; life-zero funct. available |
| Serial Interface: | RS 232 for remote control |
| Status output: | 4 relais contact for limit values, group alarm |
| Remote control: | via TCP/IP protocol (internet) |

Dimensions and Weight

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|-------------|--|
| Cabinet: | steel IP 54 |
| Options: | stainless steel, IP 65, ATEX zone 1 and 2 |
| Dimensions: | 1,060 x 600 x 520 mm (H x W x D) |
| Weight: | approx. 115 kg |

The information and the illustrations in this brochure on appearance, service, measure, weight, consumption, maintenance times and so forth, are not binding and only an approximate description. It does not assure guaranteed qualities. This product description corresponds to the state of printing. Deviations in design, tint, as well as changes of the scope of delivery remain reserved.
Version QTOCcondensate-2 E 38 11

If you require more information about our products e. g. for on-line TOC, TN_b, TP, COD, BOD, ammonium or toxicity measurement, please call us.

We are happy to advise you!

The TOC Company

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The TOC Company

LAR
PROCESS ANALYSERS AG

**The Consistent Solution
for On-line TOC Determination**

QuickTOCcondensate

Fast, continuous
online TOC measuring system

- Especially for boiler feed water
and condensate return
- TOC within a few minutes
- Fast, precise and easy
- New calibration/validation
technique

TOC determination of boiler feed water and condensate return - simple and accurate in low µg/l (ppb) TOC measuring ranges

The **QuickTOCcondensate** from LAR Process Analysers AG is an on-line measuring system for the determination of total carbon (TC), total organic carbon (TOC) or dissolved carbon (DOC) according to DIN EN 1484, ISO 8245 and EPA 415.1.

The demands on clean water in the industry and power plants are constantly growing. A possible contamination of boiler feed water and condensate return by organic pollutants becomes more and more important because of the hence resulting risks for the entire steam plant. According to VGB-R450L and ASME regulations the TOC content, (as preferred or required parameter for organic contamination), should be < 0.2 mg/l. Furthermore "it is recommended to acquire less than 0.1 mg/l TOC." (cit. VGB). A complete detection of all organic pollutants is assumed in TOC analytics.

To determine the TOC content in low ppb ranges precisely and fast during the process is already a challenge. But the immediate and accurate validation of the measured values and the calibration of the analyser are also difficult tasks for the operator. The supply and use of validation and calibration liquids is mostly time consuming and cost-intensive. It also bears a great risk of precision errors. Especially in cases like measured value increases or limit value extensions there is a high demand for a fast and reliable verification of the correct online analysis within a few minutes.

With **QuickTOCcondensate** the verification of the measured values or the calibration, is done with the patented LAR "gas calibration method" which is the fastest and the most accurate method in the industry. Without the normally necessary high amount of work and no contamination risk the **Quick-TOCcondensate** can be calibrated with calibration gas even in the lowest measuring ranges. It can also be verified with the calibration gas **at any time**. The basis of this innovative possibility is using the well-proven catalyst-free LAR high temperature combustion method at 1,200°C, ensuring a complete oxidation of all organic compounds. Wherever pure water is produced the **QuickTOCcondensate** easily meets even the strictest TOC control regulations. At the same time the efforts for calibration and value verification are exceptionally low.

| SPECIFICATIONS AND BENEFITS |
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| ● easiest calibration |
| ● simple verification of measured values (validation with calibration gas) |
| ● highest combustion temperature (minimum 1,200°C) |
| ● catalyst-free technology |
| ● self-explanatory software |
| ● closed system to avoid contaminations from ambient air |
| ● fast response time of 2-5 minutes |
| ● highest reproducibility |
| ● lowest operating and maintenance costs |
| ● CO ₂ specific infrared detection |

• Thermal Combustion Method

The **QuickTOCcondensate** was designed to determine the TOC content even in the lowest concentration ranges safely, fast and with very little maintenance efforts. By using a decomposition temperature of at least 1,200°C the measurement can be effected significantly faster. Expensive and interference prone catalysts, which might also be subject to measurement value falsification, can be omitted completely. Standard thermal-catalytic oxidation methods use only temperatures of 680°C to 1,000°C. The oxidation at 1,200°C enables the **QuickTOCcondensate** to combust even the most difficult to oxidise substances and compounds fast and completely, without memory and carry-over effects.



• Fast and Precise Measuring Results

The **QuickTOCcondensate** works in a batch mode and obtains every 2-5 minutes the respective T₁₀₀ measurement values. Compared to other continuous measurement systems this is considerably faster. It also guarantees the determination of fast and transient peaks throughout the day.

• Calibration and Validation

With the special patented LAR calibration and validation method the **QuickTOCcondensate** provides a unique opportunity to check the entire system on the correct function. A calibration gas is "injected" into the measuring system via injection loop, similar to a water sample. The extremely high and constantly controlled combustion temperature of at least 1,200°C ensures the complete oxidation of all organic compounds. In a speedy, easy and **reliable** manner the measuring system can be verified at any time. (Optional via remote control)

• Operating Principle

The analysing part of the **QuickTOCcondensate** is a closed system and therefore protected from environmental influences and other possible contaminants. It enables the **QuickTOCcondensate**, to perform precise measurements especially in low level ppb ranges.

The TOC is measured by injecting a prior defined sample quantity into the carrier gas stream. At the same time the carrier gas stream is continuously conveyed through the high temperature furnace where all water vaporises and all carbon compounds are safely oxidised to CO₂. As useful option the **QuickTOCcondensate** purifies regular ambient air to clear carrier gas. As a result **no** bottled gas and **no** instrument air must be available.

The injection system is connected with the carrier gas by a valve system. In normal state the sample passes the injection loop. At this moment the sample is drawn through the injection loop to avoid any possibility of contamination from the pump.

Different loop volumes combined with variable injection frequencies provide the easiest adaption to changing application requirements.

For a sample injection the carrier gas is shortly inserted to the injection loop leading to the actual injection into the high temperature furnace. At a temperature of 1,200°C all organic carbons are converted to CO₂. The **QuickTOCcondensate** provides all common TC and NPOC methods.

With the **QuickTOCpurity** LAR Process Analysers AG offers additionally an on-line analyser for low measuring ranges. It can determine the TOC optional via difference method (TC-TIC) and where applicable with 2 sample streams. Besides TOC process analysers for low concentrations the portfolio of **LAR Process Analysers AG** is completed with TOC online analysers for almost all concentration ranges and the most difficult applications.

