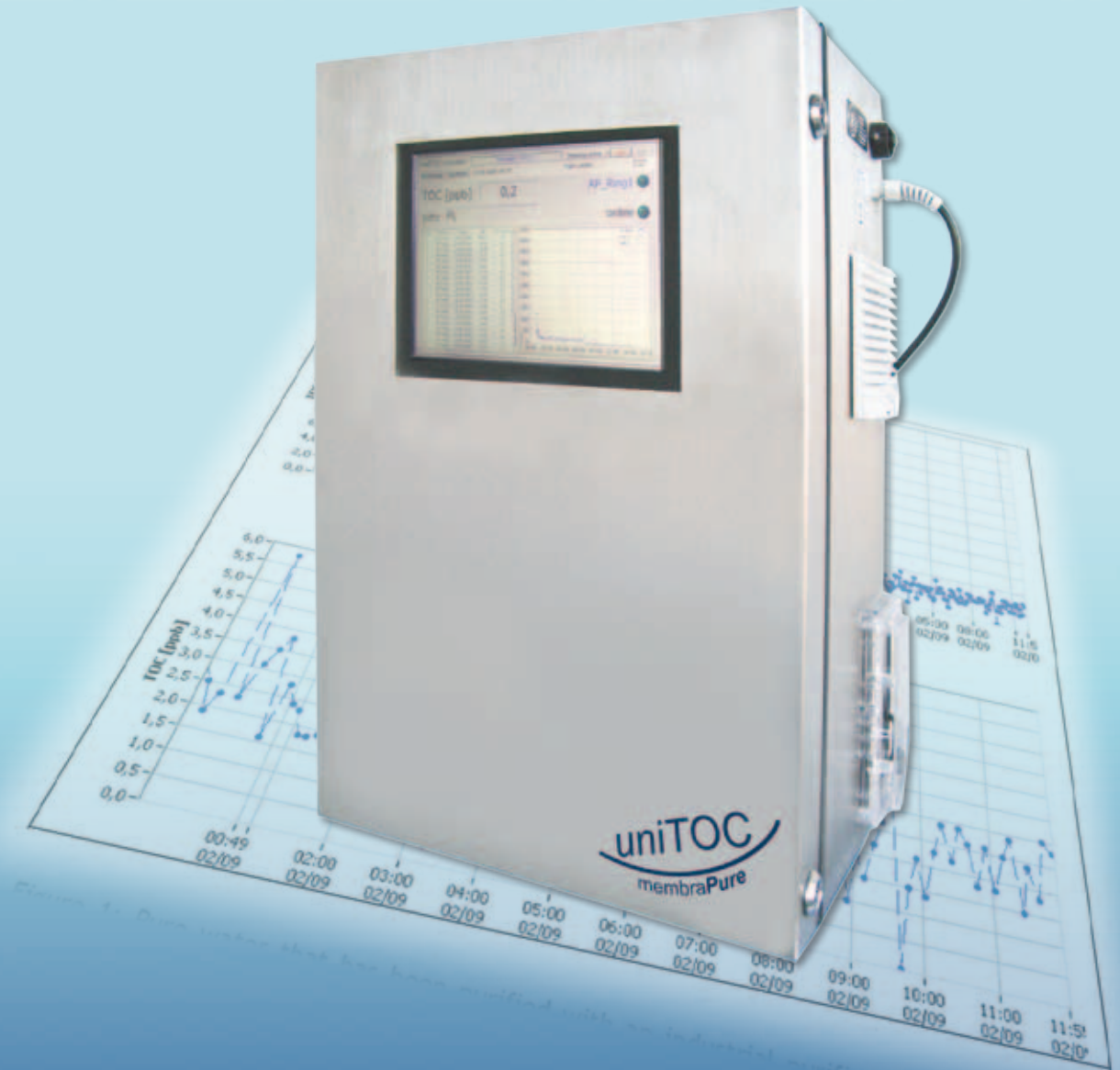


	<i>Process analysis</i> <b>uniTOC-online</b> <b>uniTOC-process</b>	<i>Laboratory analysis</i> <b>uniTOC -lab</b>
Model		
analysis mode	UV oxidation/ NDIR	UV oxidation/ NDIR
analysis parameters	TC, NPOC, TIC	NPOC, TIC, TIC/NPOC, TC
working range	≤ 10 ppm	≤ 40 ppm (autodilution mode)
detection limit	< 3 ppb (blank value)	< 15 ppb TC (DIN 32645)
analysis time	4 - 6 min.	6 min.
sample inlet	2 ports	1 port; self-priming or autosampler
sample volume	10-20 mL (loop)	1- 8 mL (syringe)
calibration	two points	multipoint
reagent	reagent free operation configurable	mixed reagent; reagent free operation configurable
carrier gas	compressed air nitrogen, oxygen	compressed air nitrogen, oxygen
operation	IPC, 10" TFT touchscreen	IPC, 10" TFT touchscreen
data access	USB, Net work	USB, Net work
option: <b>uniTOC- process</b>	SST acc.; USP/Ph.Eur 21 CFR Part 11 conform	
power supply	230 VAC, 50 Hz, <120 W;	230 VAC, 50 Hz, <120 W;
degree of protection	IP 54 optional	IP 40
dimensions	400x250x600 mm	400x250x600 mm
weight	20 kg	15 kg; (18 kg stainless steel housing)

**Control  
you need...**



**uniTOC- instruments meet the international norms**

Depending on the model, all international norms and regulations are fulfilled like :

- DIN EN 1484,
- DIN 32 645,
- DIN 38 402,
- ISO 8245,
- US Pharmacopeia (643)
- Pharmacopeia European 2.2.44

All information is subject to change without further notice.

For further information please contact:

membraPure GmbH  
Neuendorfstraße 20a  
16761 Hennigsdorf/Berlin  
Germany  
Phone: +49 (0)3302/ 202 35-00  
Fax: +49 (0)3302/ 202 35-01  
E-mail: info@membrapure.de  
Web: www.membrapure.de

Your local distributor:

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constant quality**

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# uniTOC systems - precise TOC determination

**uniTOC systems** - the precise high definition instruments for the online determination of TOC from drinking water to ultra pure water.

Two innovative instruments **uniTOC online** and **uniTOC lab** combine high end analytical components according to DIN EN 1484. The graphical control with the 10" touchscreen display and the data management of the control and analysis software fulfill all international standards for the determination of TOC.

The instruments are designed for monitoring i.e. process water in the pharmaceutical industry, microelectronics, chemistry as well as the production of potable water or ultra pure water.

membraPure provides with the **uniTOC** analyzers the perfect instruments to meet the demands of the existing regulations.



## uniTOC advantages

All fluidic lines of the instruments are manufactured by materials of highest purity like PEEK, PFA or PTFE with almost no dead volumes.

Dosage of samples is accomplished by a corrosion free peristaltic pump.

Two inlets offer double capacity for the sample uptake and TOC measurements.

UV radiation is generated by a high energy, low pressure UV lamp, which guarantees a lifespan of minimum 12 months.

The CO<sub>2</sub> concentration is measured with a NDIR detector system - CO<sub>2</sub> selective, sample temperature independent

An internal PC with touch screen operation controls and registers all instrument parameters - allows the on-line visualization of the TOC value.

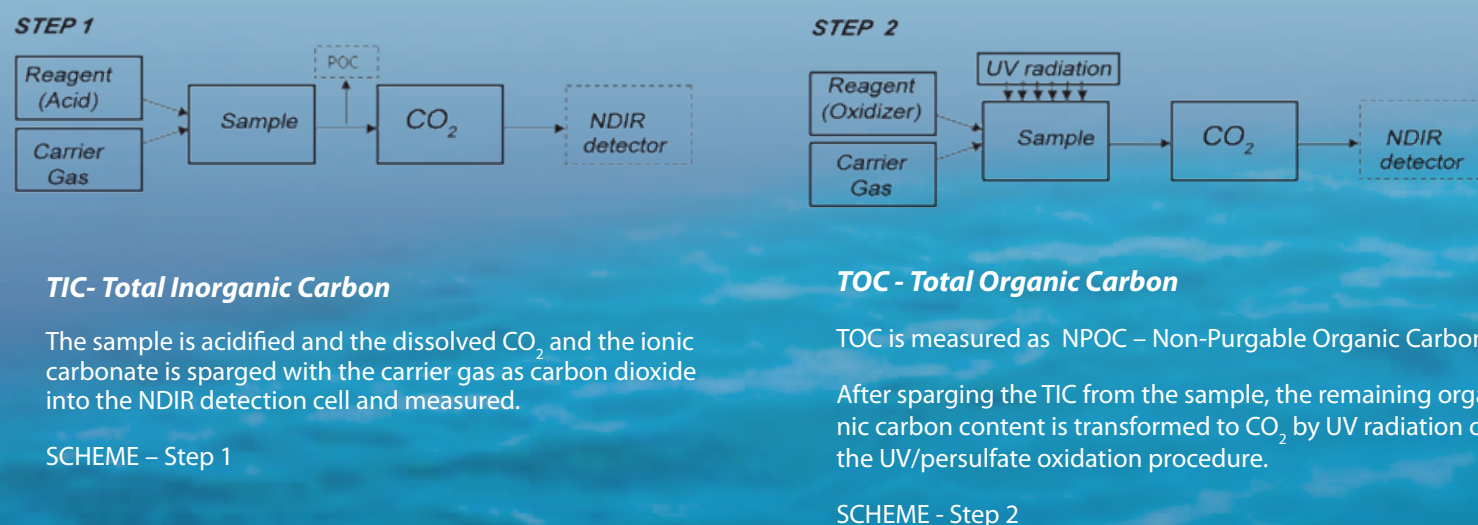
## uniTOC instruments - the principle of operation

Both instruments use the UV/persulfate oxidation procedure followed by NDIR measurement. Dependent on the sample consistency the oxidation process can even be performed reagent-free. The typical application fields of the **uniTOC** systems allow the dosage of larger volumes of sample, which guarantees high reproducibility of results as well as a high sensitivity. During standard operation, the on-line measurements have short measuring times. The continuous self-cleaning procedure of the reactor avoids any cross-contaminations. Since the quality of the sparging gas can be low, the use of pressurized air saves money and available as option.

The non-dispersive infrared detector (NDIR) system is absolutely selective to carbon dioxide and therefore independent of the sample matrix. The setup of the instruments allow the determination of total inorganic carbon (TIC) and the total organic carbon (TOC) content from the same sample. This measurements are independent of the sample temperature.

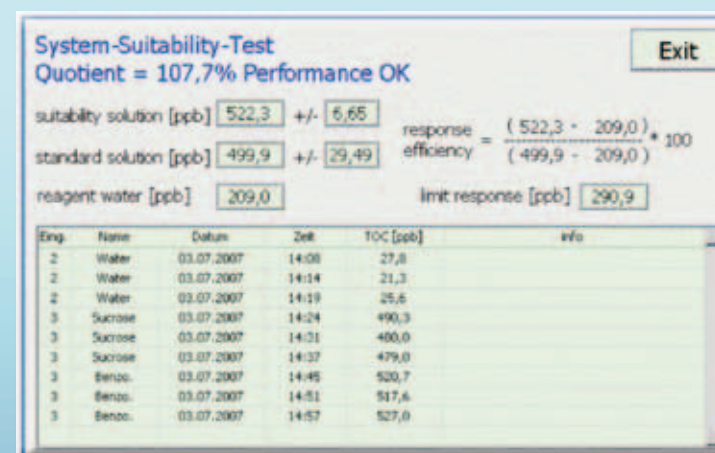
## uniTOC analysis method

SCHEME OF ANALYTICAL PROCESS



## uniTOC system validation

TOC determination requires calibration (two-or multipoint calibration) as well as linearity check to be performed in order to prove the correctness of the measured values. After installing the standard solutions, the instruments perform these checks automatically and calculate the limiting values. Also the software allows the automatized System Suitability Test (SST).



## System Suitability Test - SST

The verification of the TOC measurements according to requirements of USP and Ph.Eur are realized by the frequent performance of the System Suitability Test.

The oxidation efficiency ("response efficiency") of a hard to oxidize substance (benzoquinones) compared to an easily oxidizable substance (sucrose) must be within a range of 85 % to 115 %.

The software of the **uniTOC** instruments allows the automatic procedure and data evaluation of the test.

## Monitoring extreme low TOC concentrations

The models **uniTOC online** and **uniTOC process** are concipated for pure and ultra pure water monitoring in industrial and pharmaceutical applications. The figures show the results of online-measurements of ultra pure water with TOC concentrations in the lowest range down to 0,5 ppb.

conditions: CO<sub>2</sub>-selective NDIR-detection after UV-oxidation  
carrier gas: CO<sub>2</sub>-free compressed air

