

1080

TOTAL ORGANIC CARBON ANALYZER



Description and Function

The **1080 Total Organic Carbon Analyzer** uses high-temperature (680 °C) catalytic combustion to oxidize and convert organic compounds present in aqueous samples to CO₂ for measurement by a solid-state, non-dispersive infrared detector (SS-NDIR). The system has a wide operational range of 50 ppb to 2,000 ppm and can analyze the total organic carbon (TOC), total inorganic carbon (TIC), and non-purgeable organic carbon (NPOC) content of a variety of aqueous samples. The 1080 TOC supports USEPA-approved methods, Standard Methods, ASTM, DIN/ISO/CEN, and EU Methods. Analyze up to 300 samples per day (>100,000 per year), depending upon the method employed.

Operating Principle

The 1080 TOC employs a multi-step analysis technique to distinguish and quantify different forms of carbon present in sample matrices and determine TOC content. The value reported as TOC is the non-purgeable organic carbon (NPOC) content. NPOC is derived by first determining, or sparging, the TIC content of a sample and then introducing the TIC-free sample into the combustion reactor to oxidize organic compound constituents.

TIC concentration is determined by acidifying a sample to a pH less than 2. Carbonates and bicarbonates in the sample dissociate, forming CO₂, which is measured by a solid-state, non-dispersive infrared detector (SS-NDIR) and reported in mass and concentration values. OI Analytical's SS-NDIR has the highest mass range of any TOC detector on the market.

TIC-free samples are Pulse-Timed injected into the reactor to perform high-temperature (680 °C) combustion over a platinum catalyst. Organic compounds are oxidized and converted into CO₂, which is then quantified by the SSNDIR detector. The result is reported as the TOC content in both mass and concentration of carbon.

The 1080 TOC also supports other analytical approaches – including TC, TOC by subtraction (TC-TIC), and simultaneous determination of total bound nitrogen (TNb) using the optional TNb analysis module.

Product Features

- Wide operational range (50 ppb –2,000 ppm C)
- Supports TC/TIC/TOC/NPOC analysis techniques and standard measurements
- Patented* Smart Slide injector extends o-ring life and reduces maintenance
- Patented* Tube Guard extends furnace tube life and reduces maintenance
- Intuitive, easy-to-use software

Principal Applications

- Wastewater
- Sea water
- Industrial wastewater
- Drinking water
- Groundwater
- Cooling water

Methods

- ASTM D2579, D7573-09
- Standard Method 5310B
- ISO 8245
- USEPA 415.1, 415.3, 9060, (D/DBPR)
- DIN/ISO/CEN EN 1484
- EU PH 2.2.44
- USP 23 <643>

1080 TOC SPECIFICATIONS

Specifications	
Method compliance	USEPA, CEN, USP, EUP, ASTM, ISO, DIN, STD methods
Measurement range (ppm)	50 ppb C - 2,000 ppm C
Method TC	680 °C with platinum catalyst
Method TIC	Acidification and sparging
Method TOC	NPOC, combustion of TIC-free sample, TOC by subtraction (TC-TIC)
Furnace temperature	Adjustable, 680 °C in 1°C increments; 720 °C for TNb
Measuring time	From three minutes
Oxidation technique	High temperature catalytic oxidation, liquid samples
Options available	TN _b , A _{TOC} software for data viewing and reporting, and advanced security and auditing
Reproducibility	3.0%
Accuracy	±2% FS or 2% relative
Sample pathway	Color-coded Teflon® and PEEK® with automatic cleaning in all injection modes
Sample injection and sample handling	Injection: sipper, rotary autosampler Handling: automatic syringe with sliding TC furnace injector
Sample injection volume	50 µL - 2.0 mL in 10 µL increments
IC pretreatment	Available with autosampler
Certifications	CE; EMC: Directive 2014/30/EU; Safety: LVD 2014/35/EU; RoHS: Directive 2011/65/EU
Operation mode	Controlled via PC software (Windows 7, 8, 10 PRO)
Operating interface	Windows PC
Software (included)	Multi-instrument control via PC-based software; LIMS operation, data management, custom reports
Operating System	Windows® 7 (with Service Pack 1 or higher), Windows® 8, 8.1 & 10
Reagent purge	Yes
Reagents required	Hydrochloric acid, rinse water
Communications	USB-to-RS422 communications cable (5m length)
Input and output relays	Two user-programmable inputs, two user-programmable outputs
Ambient temperature range:	10 °C - 37 °C
Operating humidity:	<90% noncondensing
Power Requirements	115/230V AC, 50/60 Hz, 750VA max
Benchspace with autosampler	14" W x 19" D (35.6cm W x 48.3 cm D)
Gas type and grade	Oxygen or Air, 99.995% (carbon dioxide and hydrocarbon free), 50-60 psig
Dimensions	29" H x 14" W x 19" D (74 cm H x 36 cm W x 48 cm D)
Weight	17.5 kg (38.5 lbs), 37.5 kg (82.5 lbs) with autosampler option
Warranty	12 months on parts and labor

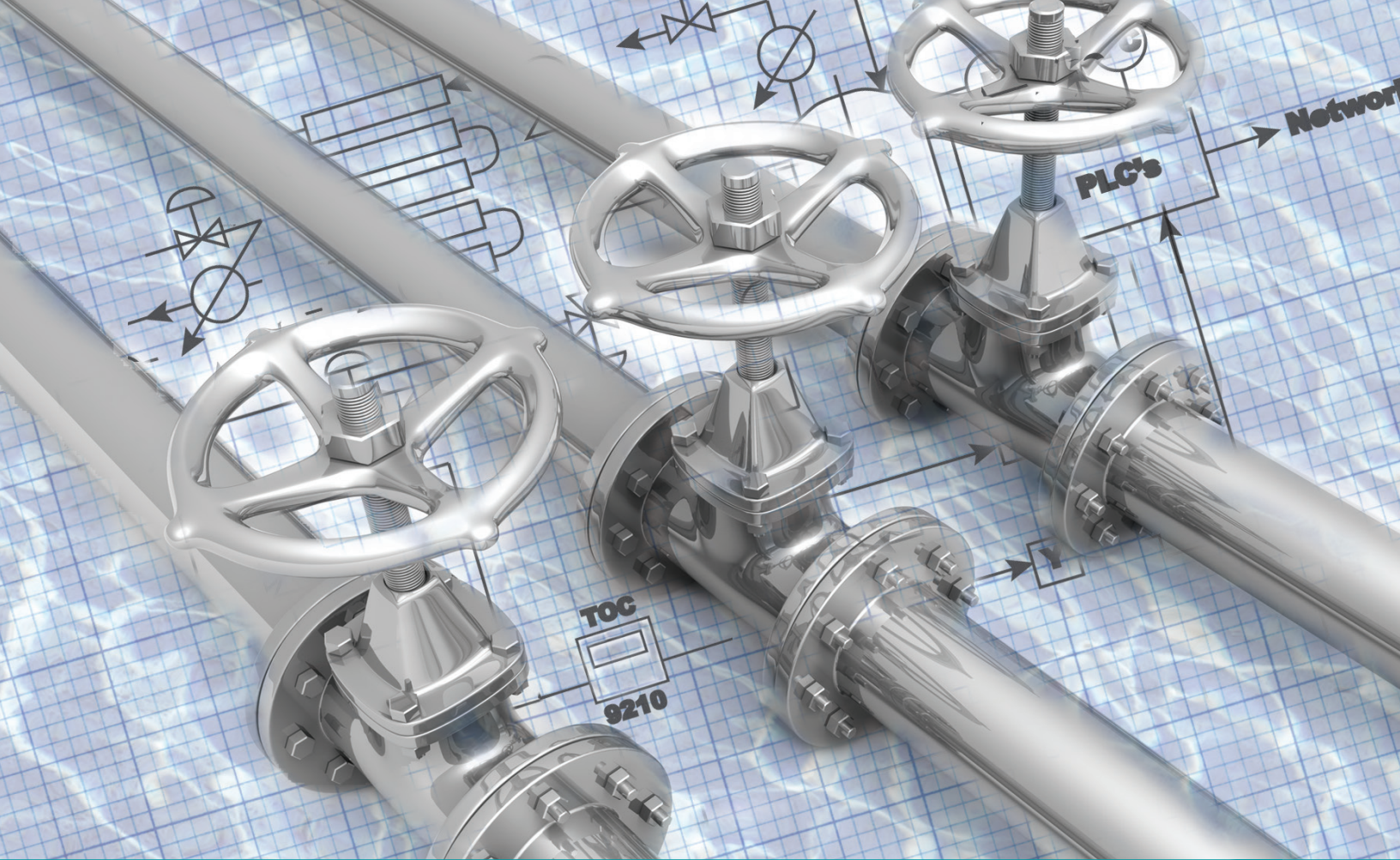


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9210p Online Total Organic Carbon Analyzer

Accurate and Dependable Water



Developed from over 45 years of TOC (Total Organic Carbon) experience, the 9210p Online TOC Analyzer provides unmatched performance, reliability, ease of use, at a lower cost of ownership to meet your specific water quality standards.

The 9210p provides water and wastewater facilities with a dynamic, real-time analysis of natural organic matter (NOM) levels in influent and effluent streams. Fast, accurate results enable facility operators to rapidly adjust the treatment process and more precisely control coagulation, flocculation, and the formation of disinfection by-products, helping the facility to stay in compliance and reduce costs.

With data that is comparable and consistent with grab samples analyzed with a benchtop system, the 9210p directly measures TOC in a wide variety of complex and ever-changing matrices.

Reliable Data for Regulatory Compliance and Process Control

Designed for continuous monitoring of organic contaminants in water and wastewater streams for regulatory compliance and optimization of the water treatment process, the 9210p is fully compliant with USEPA Method 415.3 and SM 5310C. It combines the robust heated persulfate oxidation method with a patented, solid-state infrared detection technology for unparalleled accuracy and precision across a range of 50 ppb to 250 ppm.

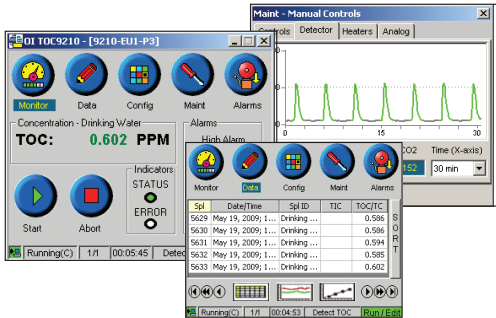
Engineered for operation in process environments, the 9210p requires no external gases, minimal preventative maintenance, and uses standard reagents. Calibration is typically stable for 12 months.

The 9210p is ideal for drinking water, municipal wastewater, surface water, ground water, and other industrial water streams.



Quality Monitoring

Total Organic Carbon Analysis Made Simple



Intuitive, Easy-to-Use Software

A large, color, touchscreen display with an intuitive, easy-to-use Windows® CE-based user interface simplifies set-up, and access to data, trending, and diagnostic screens. Result data can be output to a PC via Ethernet connection, relay/alarm closure, or as 4-20mA analog signals.

6-port Stream Selector

The capability to handle 6 individual process streams is a standard feature on the 9210p.

Simple Modular Design

Easy to maintain - No need for costly service contracts

Wall-mount Installation Kit and Reagent Rack

Sample Inlets

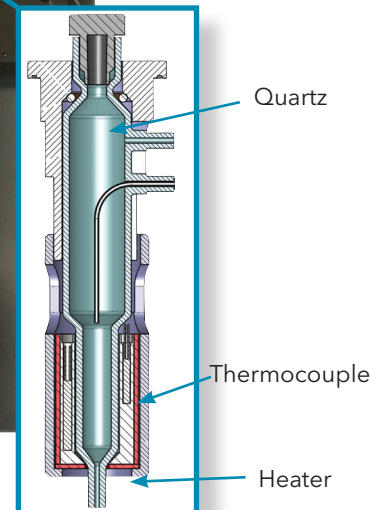
Easily grab a priority sample for lab analysis

Process Gas Module

Generates carrier gas, eliminating the need for external gases

Standard Reagents

No need for expensive, proprietary chemicals



Heater & Thermocouple

Maintains consistent temperature to ensure accurate results

Pictured is the 9210p Online Water Analysis Package, which includes the 9210p Online TOC Analyzer, 6-port stream selector, process gas module, 2 sample inlets, and wall-mount installation kit and reagent rack.

9210p Specifications

Operating Principle	Heated sodium persulfate oxidation
Measurement Technique	Non-dispersive infrared (NDIR) detection
Regulatory Method Compliance	USEPA 415.3 (Source water & drinking water) SM 5310 C (Water & wastewater)
Measurement Ranges (ppm)	0.050 to 25 / 5 to 250 ppm carbon
Instrument Detection Limit (IDL)	10 ppb C
Calibration	2 point (KHP two standards)
Measurement Accuracy	+5%
Sample Processing / Analysis Time	4 to 9 minute intervals
Operating Environment	5 - 45 °C, up to 90% humidity (non-condensing)
Operator Interface	Windows® CE-based, color touchscreen display
Reagents Required	Sodium persulfate, phosphoric acid
Gas Requirements	< 200 mL/min. 99.99% N ₂ or CO ₂ -free air
Power Requirements	24V _{DC} (Optional 24V _{DC} power supply allows operation with 90-250V _{AC} 50/60Hz source)
Input Relays	2 (remote start, remote stop)
Output Relays	2 (system alarm, sample alarm)
Analog Outputs	2 4-20mA (User-configurable concentrations)
Data Export	To PC via Ethernet, or using a USB memory stick (Microsoft® Excel®-ready .csv file format)
Instrument Enclosure	NEMA 4X / IEC Class IP-56
External Dimensions	48.3 cm H x 31.1 cm W x 31.1 cm D (19 in H x 12.25 in W x 12.25 in D)
Weight	11 kg (24 lbs)



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Aurora 1030W Total Organic Carbon Analyzer

O·Analytical 
a xylem brand

Accuracy and Productivity in



The Aurora 1030W Total Organic Carbon (TOC) Analyzer uses the proven heated persulfate wet oxidation technique to analyze organic contamination levels in aqueous samples. Virtually all organic compounds dissolved in water can be oxidized by heated sodium persulfate ($\text{Na}_2\text{S}_2\text{O}_8$). Concentrated solutions (1 or 1.5 M) can effectively oxidize organic matter present in the form of colloids, macromolecules, and suspended solids.

The Aurora 1030W can be programmed and calibrated to analyze samples containing organic carbon at levels as low as 10 ppb and up to 30,000 ppm. Depending upon method and application, up to 300 samples can be analyzed in a 24-hour period.

The reaction chamber of the Aurora 1030W is thoroughly rinsed between analyses to eliminate residue from the previous sample. This ensures the Aurora 1030W maintains the low system background necessary for high sensitivity TOC measurements. This contrasts with combustion TOC analyzers in which residual salts accumulate on catalyst surfaces, degrading oxidation efficiency and causing higher blanks and background contamination.

Test Methods Supported by the Aurora 1030W TOC Analyzer

The heated persulfate oxidation technique has been approved and adopted in numerous regulatory compliance methods, standards, and norms for water quality testing.

Method	Sample / Application
Standard Method 5310C	Drinking Water / Wastewater
USEPA 415.3	Drinking Water
USP <643> / EU 2.2.44	Purified Water
ASTM D 4779	Ultrapure Water
ASTM D 4839	Wastewater, Seawater
USEPA-DBPR	Disinfection Byproduct Rule
USEPA-SPCC	Spill Prevention & Control Countermeasures
ISO 8245	Drinking Water, Wastewater
EN 1484	Surface & Ground Waters, Potable Water

TOC Analysis

The Aurora 1030W can be equipped with a number of instrument options and automation accessories to improve sample throughput and productivity.

- An optional second oxidation chamber supports concurrent sample processing.
- An 88-position rotary autosampler fits directly underneath the 1030W to conserve bench space.
- A_{TOC} software provides 21 CFR Part 11 compliant data handling, security, auditing, and reporting capability.
- An optional validation package provides complete IQ / OQ / PQ documentation to validate an Aurora 1030W for use in pharmaceutical GLP/GMP applications.
- Multi-stream sampling module for at-line monitoring of up to four process streams.
- 1030S Solids Module operates in conjunction with a 1030W analyzer to combust solid materials for analysis of TC or TOC.
- Accessory kits to configure and interface a 1030W to an Isotope Ratio Mass Spectrometer (IRMS) or Cavity Ring Down Spectrometer to measure TOC and the $\delta^{13}\text{C}$ stable isotope ratio.



Applications

OI Analytical has been an innovator in TOC instrumentation since 1972. Hundreds of laboratories and industrial facilities rely on our TOC analyzers for their water quality monitoring applications.

Drinking Water

Pharmaceutical Cleaning Validation

Municipal Wastewater

Ground Water / Surface Water

Process Water

Boiler Feed Water & Condensate

Metal Plating Solutions

Ultrapure Water



Aurora 1030W Specifications

Operating Principle	Heated sodium persulfate oxidation
Measurement Technique	Non-dispersive infrared (NDIR) detection
Measurement Range	10 ppb C - 30,000 ppm C (multiple calibration ranges or dilution required)
Instrument Detection Limit (IDL)	2 ppb C
Operator Interface	Color LCD touchscreen display with Windows® CE-based software
Operating Modes	Standalone (Windows® CE), PC-controlled, or LAN/LIMS network connectivity
Basic Software	Single instrument operation with data transfer to PC
Optional A_{TOC} Software	Network LAN/LIMS operation, data management, custom reports, and 21CFR11 compliance
Autosampler	88 position rotary autosampler designed to fit directly underneath Aurora 1030W analyzer
Sample Injection	Manual syringe, sipper tube, autosampler, or multi-stream at-line sampling module
Certification	CE, EMC: EN61326 / Safety: IEC 61010-11 2001
Reagents Required	Sodium persulfate, 5% phosphoric acid, rinsewater
Sample Injection Volume	10µL - 10mL
Method TC	Acid and persulfate reaction
Method TIC	Acidification with Phosphoric acid and sparging
Method TOC	NPOC by heated persulfate oxidation or TC-TIC
Heating	Adjustable to 100 °C in 1°C increments
Repeatability	2.0% or 2 ppb, whichever is greater
Linearity	±1% FS or 2% relative, whichever is greater
Sample pathway	Color coded Teflon® tubing
Sample handling	Syringe with isolation loop to prevent contamination
Gas Supply	N ₂ (99.998%), zero-grade air, or O ₂ (99.998%)
Power Supply	Variable voltage, 100-240VAC, 50/60 Hz, 950W
Dimensions - Aurora 1030	42.5 cm H x 49.5 cm W x 41.9 cm D (16.75 in. H x 19.5 in. W x 16.5 in. D)
Dimensions - Aurora 1030 + 1088 Autosampler	26.75 in. H x 19.5 in. W x 23 in. D
Weight - Aurora 1030 + 1088 Autosampler	15.4 kg (34 lbs.), 34.5 kg (76 lbs.) 1030W + 1088



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