

# Sievers\* TOC-R3 Online TOC Analyzer

**Robust. Reliable. Responsive.**



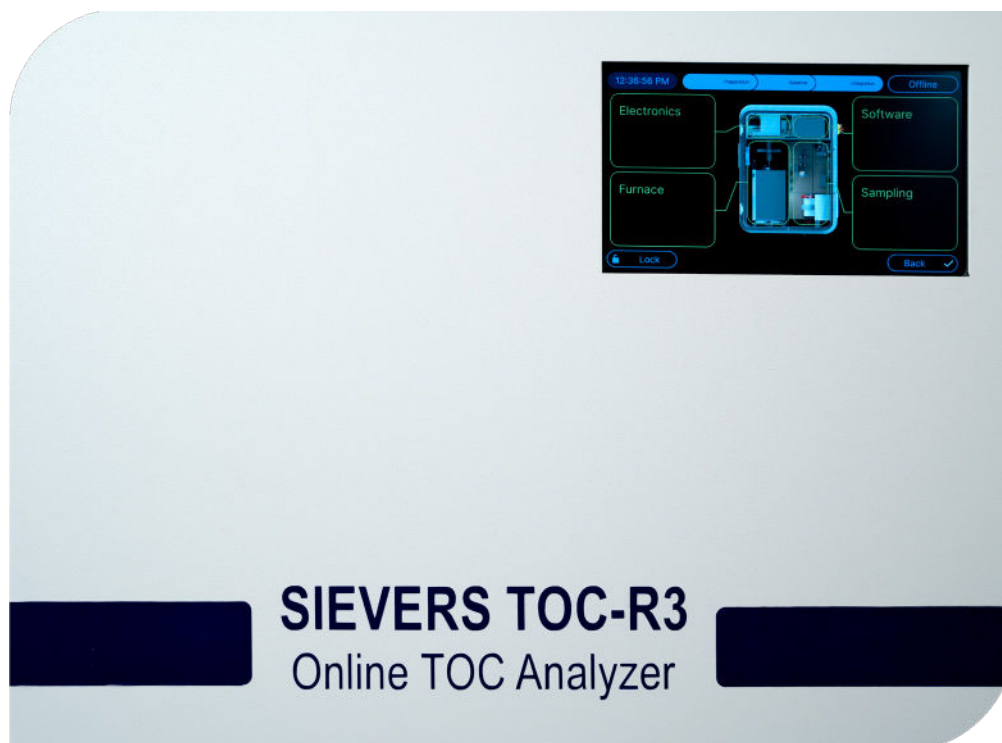
# TOC-R3: Robust. Reliable. Responsive.

The Sievers TOC-R3 Online Total Organic Carbon (TOC) and Total Nitrogen (TN) Analyzer is designed to solve critical industrial and environmental water challenges.

Offering seamless operation, minimal maintenance, and enhanced uptime, the TOC-R3 uses highly efficient and reliable 1,200°C catalyst-free combustion oxidation.

From source water contamination and condensate leaks to wastewater optimization and discharge, the TOC-R3 is a peace of mind analytical tool that provides responsiveness and repeatability when you need it.

The TOC-R3 provides high instrument uptime so operators can focus on optimization and decision making with robust, responsive, and reliable data. It is flexible and customizable to meet specific application needs with options for automation, parameters, and enclosures.



## OVERVIEW:

### COMBUSTION REDEFINED.

The TOC-R3 uses 1,200°C complete combustion oxidation followed by proven NDIR detection of the evolved CO<sub>2</sub>. To maximize uptime, the TOC-R3 has a revolutionary industrial design with minimal moving parts and carries out sample combustion in a ceramic reactor with no catalyst needed, ensuring low maintenance and reducing cost of ownership.





- Measures total carbon (TC), total inorganic carbon (TIC), total organic carbon (TOC), and non-purgeable organic carbon (NPOC).
- Offers unique volatile organic carbon (VOC) detection through a reliable and accurate photoionization detector (PID).
- Provides additional total bound nitrogen (TN<sub>b</sub>) detection using a simple, lightweight, and small electrochemical detector (ECD).

## KEY FEATURES:

- Catalyst-free, high temperature combustion delivers complete oxidation at 1,200°C
- Minimal and simple maintenance due to modular design and status monitoring
- Self-cleaning and automated rinsing capability to tackle harsh samples
- Low chemical consumption for safety and lower cost of ownership
- Advanced data management and intuitive software for straightforward user experience
- Enhanced troubleshooting using predictive maintenance and remote control

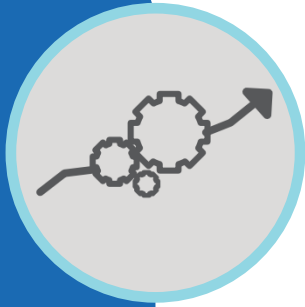


# INDUSTRIES & APPLICATIONS:

Industries	
	Hydrocarbon Processing
	Chemical Processing
	Food & Beverage
	Municipal Water & Wastewater

Applications
<b>Source water:</b> raw water, environmental water
<b>Process water:</b> ingredient water, rinse water, oil in water
<b>Utility water:</b> steam, condensate, cooling water
<b>Wastewater:</b> influent, effluent, reuse, stormwater, de-icing





### Superior Robust Analytical Performance

- Predictive diagnostics and status monitoring
- Minimal and simple maintenance with modular design
- Broad analytical ranges and protection classes for environments



### Ultimate Reliability

- Complete oxidation of hard to degrade compounds
- Elimination of interference and downtime due to catalyst failures
- Automated calibration, self-cleaning, and check standard capability



### Enhanced Responsiveness

- Quick 3-5 minutes analysis time
- Optional Leak Detection Mode for alert of a leak
- Optional Broad Range Detector to detect high and low values

## COMPLIANCE:

- **US EPA Method 415.1** – Method determines organic carbon in drinking, surface, and saline waters; domestic and industrial wastes
- **US EPA Method 415.3** – Measurement of total organic carbon, dissolved organic carbon, and specific UV absorbance at 254 nm in source water and drinking water
- **DIN EN 1484/ISO 8245** – Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC) in drinking, ground, surface, sea, and wastewater
- **ASTM D5173** – Standard Guide for On-Line Monitoring of Total Organic Carbon in Water by Oxidation and Detection of Resulting Carbon Dioxide
- **SM 5310B** – Standard Methods 5310B High-Temperature Combustion TOC Method
- **HJ 501** – Water quality - Determination of total organic carbon—Combustion oxidation nondispersive infrared absorption method
- **DIN EN 12260** – Determination of nitrogen - Determination of bound nitrogen ( $TN_b$ ), following oxidation to nitrogen oxides

# Adaptable for different applications



## OPTIONS & ACCESSORIES

- Distinctive Photoionization Detector (PID) for Volatile Organic Carbon (VOC) Detection
- Total Nitrogen with Electrochemical Detector (ECD)
- Communication Box (Streamlined SCADA Connections)
- Air Box - Stand Alone Carrier Gas System (Avoid using plant air)
- Explosion Proof Enclosures: ATEX, IECEx, C1D2
- COD/BOD Conversion
- Automated internal dilution for range extension
- Particulate sampler for high particulate loaded streams
- Mounting Rack

# Specifications

## Operating Specifications

Analytical Methods	Standard: TC, NPOC Option: TIC, TOC <sub>diff</sub> , POC/VOC*, TN <sub>b</sub> *
Ranges	TC/Carbon: 0-10; 0-200; 0-2,000; 0-10,000; with dilution 0-50,000 mg/L; Wide Range: 0-200; 200-20,000 mg/L; TN <sub>b</sub> *: 0-150 and 0-1,500 mg/L; POC/VOC*: 0-25 mg/L
Options/Accessories	Leak Detection (for TC only), Sample Stream 2, Particulate Sampler, Air Box, Air Scrubber, Communication Box, Mounting Rack, PID Detector* (for POC/VOC) or ECD Detector* (for TN <sub>b</sub> )
Features	Auto-calibration, Dilution, Check Function, Auto Rinse, Connectivity (Remote Control), Predictive Maintenance
Precision	+/-2% End of Detector Range <sup>†</sup>
Linearity	R <sup>2</sup> ≥0.997 <sup>†</sup>
LOD	<1 ppm <sup>†</sup>
Analysis Time	3-5 min typically
Smallest Inner Diameter (ID)	2 mm smallest tubing diameter
Salt Tolerance	3-5% NaCl
Carrier Gas	CO <sub>2</sub> free air < 1 ppm CO <sub>2</sub> and <0.1 ppm hydrocarbon: 100-200 kPa @ 30-50L/hr flow rate (Optional: Air box)
Sample Temperature	2-60°C (35.6-140°F)
Ambient Temperature	2-40°C (35.6-104°F)
Minimum Sample Flow Rate	100 mL/min without Particulate Sampler or 11.7-50 LPM (3.1-13.2 US gal/min) with Particulate Sampler
Drain	Gravity, No back pressure (< 7 kPa, 0.07 Bar, 1 psig)

## Analyzer Specifications

Communication protocols	OPC-UA, Modbus TCP/IP
Inputs	Digital Input (4)
Display	7 in. Touch panel
Power	AC 110 – 230 V ±10 V, 50/60 Hz, 400 – 600 VA
Outputs	Ethernet, 0/4-20 mA (6), Programmable Digital Relay (4)
Installation/Overvoltage Category	II
Available Configurations	Standard: Single-stream; Option: Second stream
Dimensions	900 H x 644.3 W x 354.5 D mm (35.5 H x 25.4 W x 14 D in)
Weight	55 kg (121 lb)
Safety Certifications	CE, UL, CSA
Regulatory	DIN EN 1484 /ISO 8245, EPA 415.3, SM 5310B, ASTM D5173, HJ 501, DIN EN 12260

## Environment

Enclosure	Standard: IP-54; Option: ATEX Zone 1 & 2 T4, IECEx Zone 1 & 2 T4, C1D2
Maximum Relative Humidity	Up to 85% non-condensing

<sup>†</sup>Stated analytical performance achieved under ideal laboratory conditions using 0-10 mg/L, NDIR Detector.

\*Requires the purchase of an Optional Detector; either PID Detector (for POC/VOC) or ECD Detector (for TN<sub>b</sub>).

The analyzer cannot be configured with both purchasable detectors.

# Resourcing the world

**Veolia Water Technologies**  
Please contact us via:  
[www.veoliawatertechnologies.com](http://www.veoliawatertechnologies.com)