VEOLIA

Sievers* M500e

Total Organic Carbon (TOC) Analyzer

Accurate. Precise. Always ready.

WATER TECHNOLOGIES

The Sievers M500e TOC Analyzer revitalizes online detection of critical organic contaminants, optimizes yield, and ensures ultrapure water quality.

Advancing the SIEVERS LEGACY

Advancing the Sievers Legacy

Building on the stability of the prior model, the Sievers 500 RLe TOC Analyzer, the M500e boasts a sophisticated interface, accuracy at ultra-low-levels, and results within minutes. Advancing the decade-long Sievers legacy within the microelectronic space, the M500e is the third-generation online analyzer. It utilizes Sievers' reagentless Membrane Conductometric technology to deliver accuracy, precision, and stability below 1 ppb TOC.

Superior Performance and Features for the Microelectronic Industry

2^{x}

ACCELERATED RINSE: DOUBLE THE SPEED

To maximize uptime and low-level data collection capabilities, a quicker rinse time of the M500e offers:

- >50% faster rinse cycles compared to previous generation (down to 3 minutes)
- Maximum data generation even after maintenance or consumable replacement

KEY FEATURES

OPTIONS

— Conductivity/Resistivity
— WiFi & Ethernet for remote data access

10” TOUCHSCREEN

— Intuitive interface
— At-a-glance viewing of settings
— Chemical resistant

DESIGN

— IP55 & full IP connections
— Same footprint as 500 RLe for easy upgrades

SAMPLE SYSTEM

— Integrated Online Sampling System (iOS) capable of standards addition
— Base model with stainless steel sampler

250 ppb

LOW-LEVEL CALIBRATION AND VERIFICATION PROTOCOLS: ENSURE QUALITY AND CONTROL

New low-level calibration (250 ppb of potassium hydrogen phthalate [KHP]) and verification (100 ppb of isopropyl alcohol [IPA])

— Calibrate closer to operating range with certified standards and verify with difficult-to-oxidize compound

<1 ppb

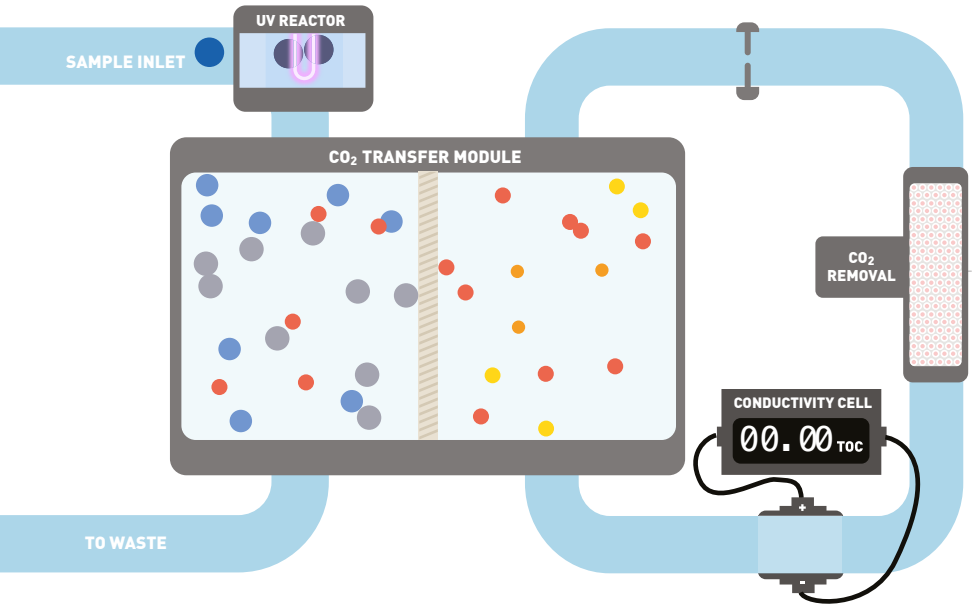
ADAPTIVE AUTOZERO: AUTOMATICALLY ADJUST TO CHANGES

The M500e automatically determines the TOC autozero frequency based on the change in TOC offset. This allows for:

— Correcting discrepancies in results
— Eliminating manual changes in autozero frequency
— Precision and stability below 1 ppb TOC
— Instrument-to-instrument matching

Sievers Membrane Conductometric TOC Detection Technology

Proprietary gas-permeable membrane selectively passes only the CO_2 produced from oxidized organics



Unmatched reliability, robustness, and accuracy

Higher selectivity, sensitivity, stability, and precision

Discriminates between **organic** and **inorganic** carbon to provide critical information for process control

LEGEND

Organic Carbon Molecule

SO_4^{2-} Cl^- CO_2 HCO_3^- H^+

Enhanced responsiveness & quick analysis

— Three-minute analysis time

— Accelerated rinse

— Adaptive autozero

— Low-level calibration & verification

Superior analytical performance

— TOC analytical range: 0.03 ppb – 2.5 ppm

— Conductivity range: 0.01- 800 uS/cm (also displayed as resistivity)

— IP55 for instrument and all connections

Seamless interface and data management

— Faster and easier setup & operation

— Responsive, information-rich touchscreen display and user interface

— Updated and comprehensive data management and data transfer suite

Applications

MICROELECTRONICS

Consistent ultrapure water (UPW) production is critical for microelectronics manufacturing. By implementing TOC monitoring with the Sievers M500e, facilities can:

- Ensure that water quality meets the recommended TOC limits
- Guarantee complete recovery of organics especially in environments that are not conducive to oxidation
- Deliver reliable recovery data for compounds present in source waters, resin systems, and production processes to enable proactive actions, protect the product quality, and advance system troubleshooting
- Help fabrication operations overcome risks associated with undetected organics that can affect lithography

OTHER UPW APPLICATIONS

Steam generation water systems require ultrapure water quality for optimal operations. With the M500e, plants can:

- Analyze low-levels of contaminants such as sugars, cleaning agents, cooling fluids, or organic acids with the use of one parameter: TOC
- Ensure feedwater quality to mitigate damage and plant downtime
- Detect contamination in heat exchangers and protect polishing systems and equipment
- Identify the presence of compounds that create corrosive environments, thus avoiding plant shut down and equipment damage
- Guarantee TOC has been limited to <100-200 ppb as suggested by various power industry associations

For more information, visit watertechnologies.com/sievers

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SPECIFICATIONS

TOTAL ORGANIC CARBON	
Linear Range	0.03 to 2,500 ppb as TOC
Accuracy	± 5% of measurement; ±0.1 ppb
Precision	± 1% of measurement; ± 0.03 ppb
Analysis Modes	Online, Online Averaged, Online Timed, Grab
Analysis Time[1, 2]	3 minutes for continuous online measurements
Ozone Compatibility	50 ppb O_3 continuous; 200 ppb O_3 for 2 hours daily
Sample Flow Rate (nominal)	0.25 mL/min
External Flow Rate	Minimum 50 mL/min
Sample Temperature	1-95°C (34-203°F) (withstands short-term steam exposure)
Sample Pressure	Up to 100 psig
Interferences	Insensitive to organic heteroatoms
Calibration Stability	Typically stable for 12 months
Display Readout	3 significant digits
CONDUCTIVITY	
Range	0.01 to 800 µS/cm
Accuracy	0.005 µS/cm or 1%, whichever is larger
Precision	≤ 1.0 % RSD
INSTRUMENT	
Power Requirements	100–240 VAC, 70 W, 50/60 Hz
Fuses	No user-replaceable fuses
Normal Operating Environment	Intended for indoor use only
Ambient Temperature	5-40°C (41-104°F)
Maximum Relative Humidity	Up to 95%, noncondensing
Maximum Altitude	3,000 m (9,843 ft)
Inputs	Two isolated binary inputs
Outputs	Serial (RS-232), one USB, three 4-20 mA, four alarms, one Ethernet
Installation/Overvoltage Category	II (protects against transients present in Category II power)
Safety Certifications	CE, ETL listed. Conforms to UL Std. 61010-1. Certified to CSA 22.2 No. 61010-1.
Pollution Degree	2 (normally only non-conductive pollution)
Display	Backlit 10.1", 1280 x 800, touchscreen display
Size	H: 43.4 cm (17.1 in) W: 55.9 cm (22.0 in) D: 28.7 cm (11.3 in)
Weight	13.6 kg (30 lb) [Standard iOS]
IP Rating	IP 55
Optional Wi-Fi[3]	802.11ac/a/b/g/n Dual band 2.4/5 GHz
Industrial Communications Protocols	Modbus TCP/IP

[1]Time to first measurement is 10 minutes.
[2] Not available in all countries

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Veolia Water Technologies
Please contact us via:
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