

## comparison of the Sievers\* 500 RL/e and M500/e TOC Analyzers

The Sievers M500/e Total Organic Carbon (TOC) Analyzer is our third generation online TOC analyzer designed for accuracy, efficiency, and integrity. Building upon the proven results of the 500 RL/e, the M500/e advances online TOC and Stage 1 conductivity monitoring by improving our industry-leading performance and adding a suite of new advanced features:

- **Reducing analysis time by 50%** facilitates utilization of real-time data, early detection, and process control.
- **10-inch touchscreen** enables faster and easier setup and operation.
- **50% reduction** in service, calibration, validation, rinse down, and protocol run times.

	500 RL / 500 RL <sub>e</sub>	M500 / M500 <sub>e</sub>	Enhancement
<b>Performance</b>			
TOC Range	0.03 to 2500 ppb	0.03 to 2500 ppb	<b>Same dynamic range</b>
TOC Accuracy	± 5% or ± 0.1 ppb, whichever is greater	± 5% or ± 0.1 ppb, whichever is greater	<b>Same industry-leading accuracy</b>
TOC Precision	≤1% or 0.03 ppb, whichever is greater	≤1% or 0.03 ppb, whichever is greater	<b>Same stable results</b>
pH Range	pH 5.5 to 8.0	pH 5.5 to 8.0	
Analysis Time	6 minutes	3 minutes	<b>50% reduction in analysis time. &gt;50% faster rinse down time to low level analyses</b>
Time to First Measurement	14 minutes	10 minutes	<b>30% reduction in time to first measurement</b>
Conductivity Range	0.01 to 35 μS/cm	0.01 to 800 μS/cm	<b>Slightly improved conductivity measurement range</b>
Conductivity Accuracy	0.005 μS/cm or 1%, whichever is larger	0.005 μS/cm or 1%, whichever is larger	<b>Same dynamic range</b>
Conductivity Precision	≤ 1.0 % RSD	≤ 1.0 % RSD	<b>Same dynamic range</b>
<b>Features</b>			
Display	Quarter VGA color touch screen	Backlit 10.1-inch (1280 x 800) touch screen	<b>Larger, sharper, brighter interface</b>
Inputs	1 isolated binary input	2 isolated binary inputs	<b>100% increase in inputs</b>
Adaptive Auto-Zero	Manual auto-zero functionality	Adjusts to changes, and determines auto-zero frequency, automatically	<b>New, more user friendly feature</b>
Startup Wizards	--	Setup, diagnostics, and maintenance wizards	<b>New wizards provide pictures, tools, and tutorials for instrument operations</b>

Data Communication	Three isolated 4-20 mA outputs, one Serial (RS-232) One USB port, four alarm outputs, one Ethernet port One parallel printer port	Three isolated 4-20mA outputs, one Serial (RS-232) One USB port, four alarm ports, one Ethernet port Options: WiFi, Profinet, Profibus	<b>Advanced communications added for seamless data transfer, export, and import</b> <b>Improved security by eliminating USB-based data transfer</b>
Data Export	USB port, encrypted data output	USB port, Network Drive, Profinet, WiFi, Modbus TCP/IP, Optional: WiFi, Profibus	<b>Expanded options for local and remote export</b>
Real Time Diagnostics	Basic diagnostic routines for hardware components and software.	Enhanced hardware and software diagnostic routines, internal flow sensor, and viewable settings, & constants	<b>Easier &amp; faster troubleshooting, more reliable measurements</b>
TOC Calibration	Automated single and multi-point. Typically, stable for 12 months.	Fast, automated single or multi-point calibration with 12-month stability	<b>50-75% less calibration time</b>
Integrated On-Line Sampler (iOS)	Base, iOS, and Super iOS configurations. 4-port Super iOS for automating all system protocols and running standards and grab samples	Base, iOS, and Super iOS configurations. Added configurable protocols, configurable grab sampling, and auto-start available in online mode	<b>Added features with more automated capabilities</b> <b>Greater grab sample flexibility, allowing for application-specific sample protocol configurations</b>
<b>Accessories and Supporting Products</b>			
Consumable Replacement	Resin Bed, UV Lamp, Pump Heads	Same consumable categories but easier and simpler to replace parts	<b>Greatly improved accessibility of parts and ease of use with fewer individual components to replace.</b>
21 CFR Part 11 Software	DataGuard 500	DataGuard M500	<b>Vastly improved data integrity, data security, data transfer, and data management capability</b>
Validation Support	IQ, OQ, PQ	IQ, OQ, PQ	<b>Same high quality validation documentation</b>
<b>Physical Parameters</b>			
Dimensions (cm)	H: 41.9 cm; W: 48.3 cm; D: 27.4 cm	H: 43.5; W: 55.9 cm; D: 28.7cm	<b>Similar size as the 500 RL/e</b>
Dimensions (in)	H: 16.5 in; W:19 in; D: 10.8 in	H: 17.1 in; W: 22 in; D: 11.3 in	<b>Similar size as the 500 RL/e</b>
Installation	Same bracket footprint for installation	Same bracket footprint for installation	<b>Easy physical replacement to the 500 RL/e</b>
Weight	16.9 kg (37.2 lbs.)	16.3 kg (36 lbs.)	<b>Slightly lighter (Super iOS configuration)</b>
Enclosure Rating	IP-45	IP-55	<b>Improved IP rating including water and dust resistance</b>

