AUTOMATIC MULTI-METHOD TOC ANALYZER

- **Five Oxidation Methods in One Analyzer**
- **103 Sample Stations & 1 Wash Station**
- **Dual NDIRs**
- **Widest Dynamic Range**
- **Ease of operation with familiar Windows Software**
- **Reliability Through Simplicity**

Unmatched Versatility & Reliability

Available Oxidation Methods

High Temperature Combustion
For difficult to oxidize or high TOC concentration sample requiring good accuracy of analysis or in industrial salts less than 1%.

UV/Heated Persulfate
Excellent TOC accuracy from low parts-per-million to moderate concentrations of salt-free samples with minimum maintenance.

Heated Persulfate
Good low level TOC Accuracy at wide range of applications.
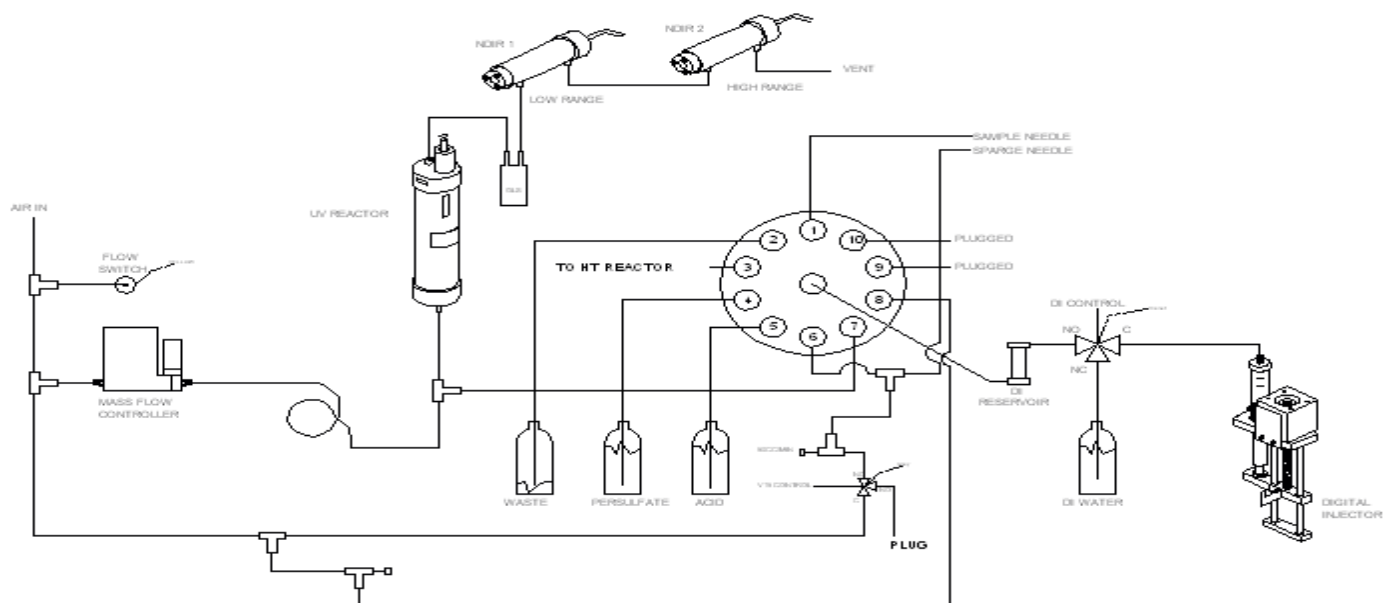
Ozone Promoted/Hydroxyl Radical
Excellent low to high levels of TOC analysis for difficult to oxidize samples or in undiluted acids or industrial salts up to 26%. Offers low maintenance & is often successfully substituted for High Temperature Combustion Method.

Ultra Pure Analysis (UV/NDIR)
Unsurpassed UV/NDIR detection for interference-free accuracy in the "parts-per-billion" ranges on a variety of sample matrices. Compliant with USP 23 <643>

Measurement Principle and Flow Diagram - Automatic Benchtop

The general flow diagram is shown below. Note that this standard configuration is capable of performing up to five (5) different methods with different ranges on 103 samples in a single run! The design architecture of the analyzer also allows for optional upgrades to be added later, extending your future capability.

The StarTOC Automatic Benchtop analyzer is capable of TOC, TIC, and TC analysis using the following methods:

- High Temperature Combustion
- UV/Heated Persulfate
- Heated Persulfate

- Ozone Promoted/Hydroxy/Radical
- Ultra-Pure (UV/NDIR)
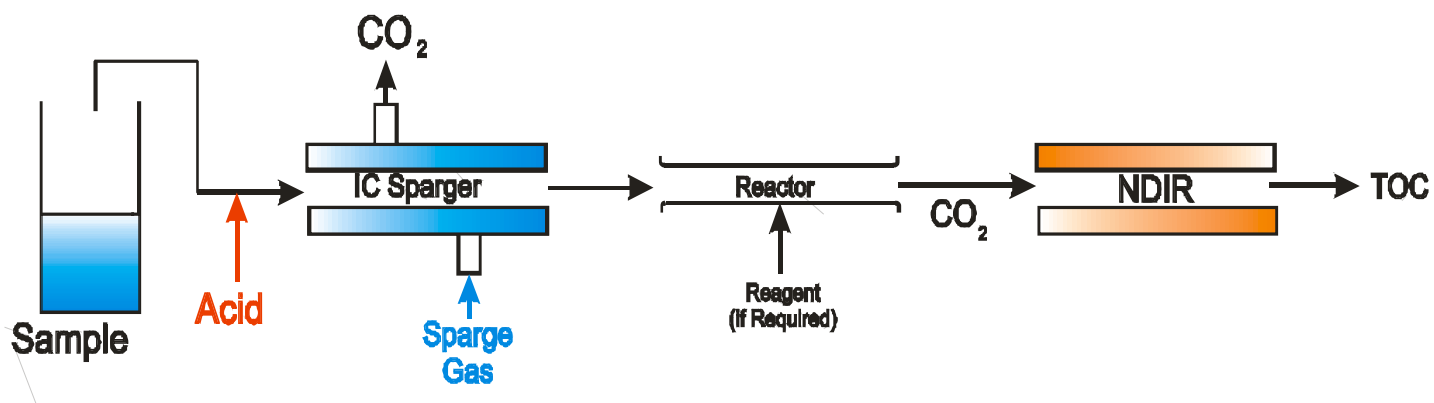
Sample is mixed with acid, lowering the pH to 2.0. This converts the inorganic carbon to dissolved CO_2, which is Air/O_2 stripped out of the solution. Reagent is added if required and the remaining organic carbon is then oxidized in the Reactor to form CO_2, which is detected by the NDIR as an interference-free direct correlation to TOC.
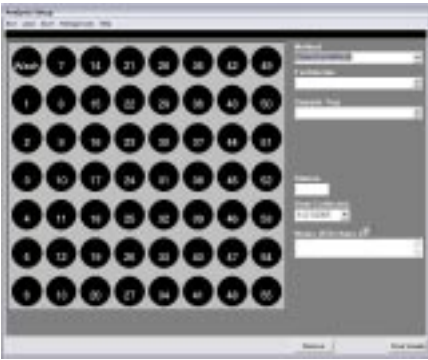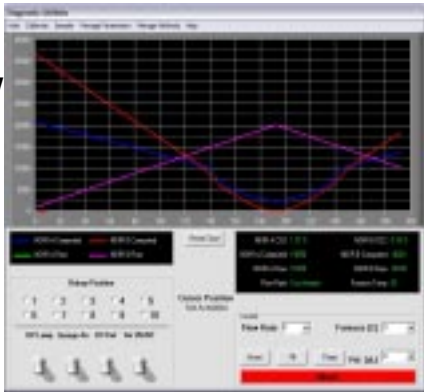
View with High Temperature Combustion Module

Software

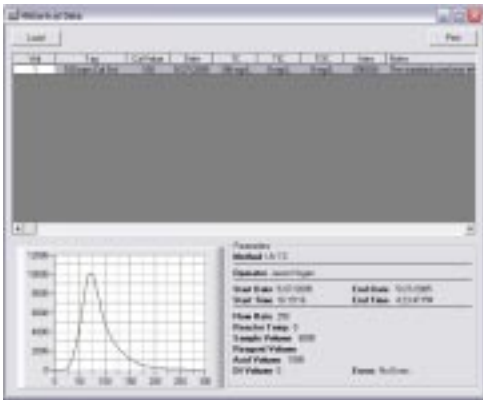## Designed for Results-Oriented Users

From Initial Setup

Through Auto-Calibration/ Diagnostics

To Sampler Loading/ Run Setup

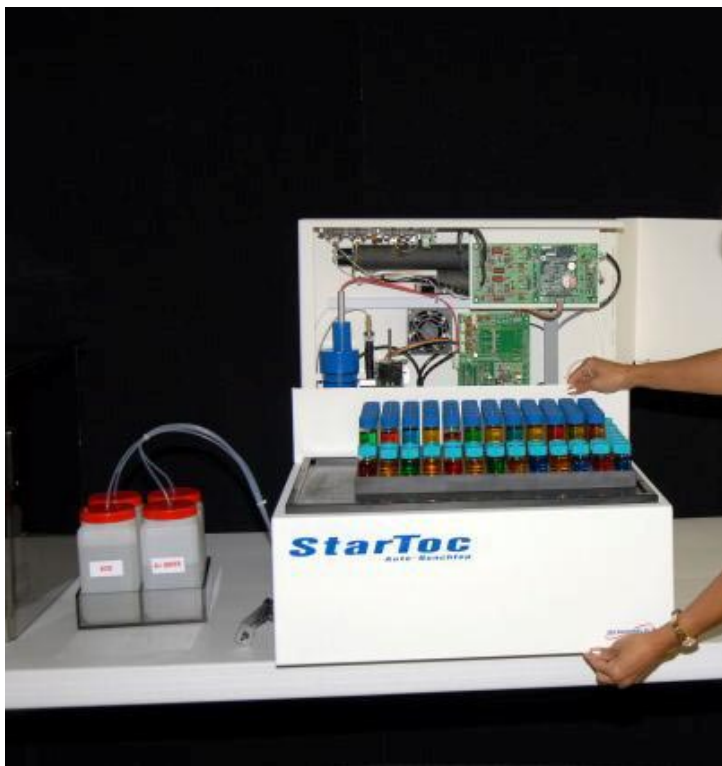**With Clear, Simple Diagnostics**

To Retrieving stored results

For Easy-to-use, uncomplicated, highly accurate TOC analysis
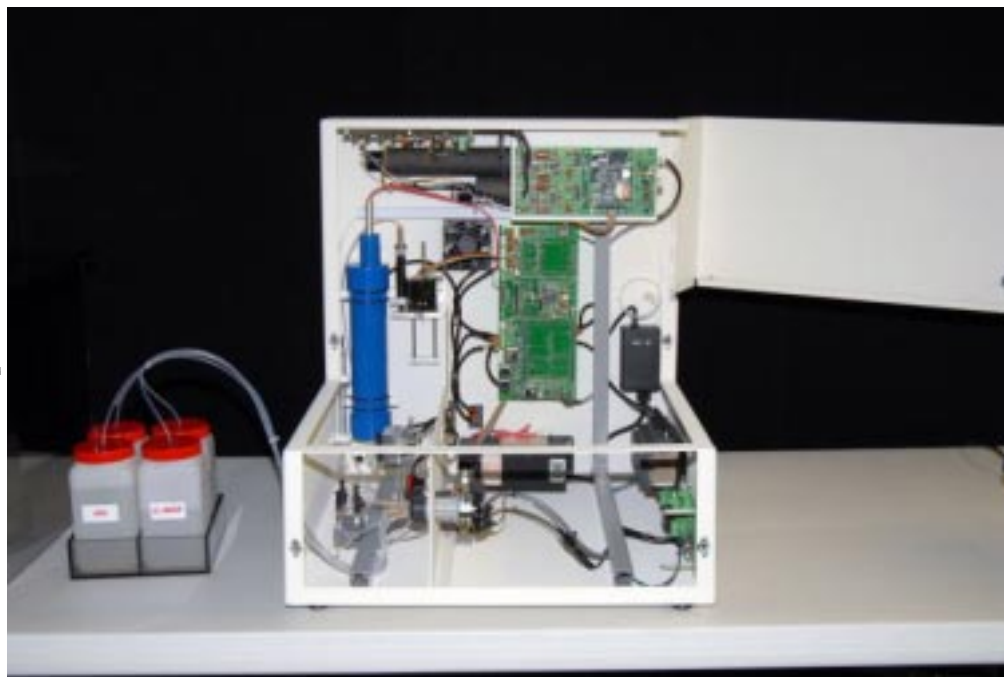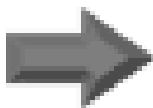
BEST SERVICEABILITY

EASY ACCESS FOR SERVICE

- Open Access Door with Key Lock

- Pull Lower Compartment Cover from Self-Locking Clasps

- All in Under One Minute

To Reveal

⬇

TRUE MODULAR CONSTRUCTION FOR EASY PARTS EXCHANGE ➡


THE STAR PARTS EXCHANGE SERVICE POLICY

- No Equipment Repair
- Module Exchanges
- Replacement Modules Normally Shipped Same Day as Notification

X-Y-Z AUTO-SAMPLER

- **Integral Sampler Conserves Bench Space.**
- **Efficient Sample Preparation**
  - **Same Station Acidification, Sparging, Mixing & Analysis provides most accurate TOC Analysis by Minimizing Volatile Organic Loss.**
  - **Ability to select multiple station acidification & sparging to maximize throughput.**
- **Simple rugged mechanism for increased reliability.**

# StarTOC NDIRs (The key component for reliable TOC analysis)
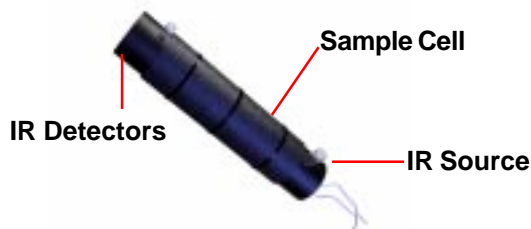
- Specific, Interference-Free CO_2 Detection
- Single-Beam
- Dual-Wavelength Ratioing Compensates for Drift
- Computer-Controlled for Accuracy
- Sapphire Protected Optics
- Non-Corrosive, Non-Reflective Sample Cell (Borosilicate)

- No Moving Parts for Easy Maintenance and Service
- No Critical Realignment Required

Detection Technique

The NDIR CO_2 detector uses a solid-state, dual-wavelength system with a single borosilicate glass sample cell that requires no wall reflectivity or removal of acid gases. There is a reference and a CO_2 specific detector in the sample path. Use of the true zero filter eliminates water vapor interference. An infrared source is cycled on and off to avoid mechanical choppers required in alternate NDIRs. The NDIR has **no moving parts**.
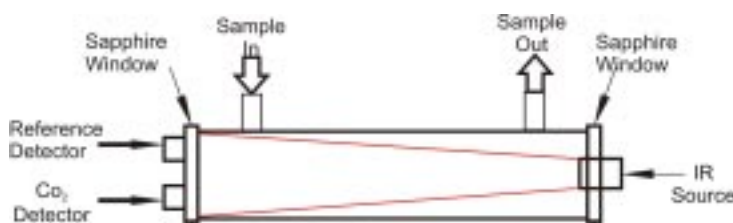
Automatic gain control (AGC) is employed during the reference/sample cycle to compensate for such factors as IR source deterioration, dirty optical windows, and detector gain changes. All critical optics are protected by sapphire windows. The sample cell can be easily removed and the windows cleaned within 3 minutes, without realignment or the use of any tools.
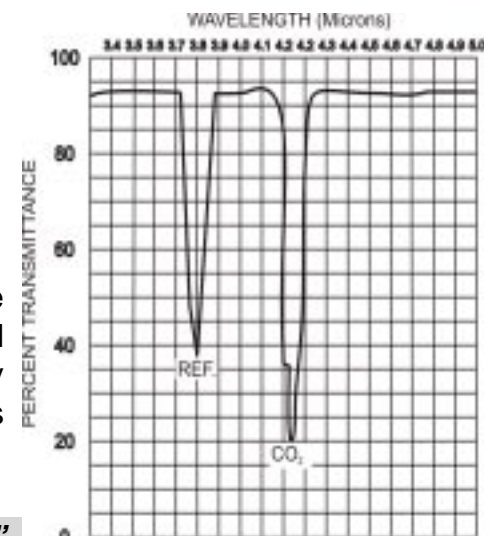
"Unique With All StarTOC Analyzers"

5 Year Warranty on NDIR Sample Cell; 2 Year Warranty on Complete NDIR Bench

StarTOC

Automatic/Computer-Controlled
TOC Benchtop Analyzer

Specifications (Nominal, at 25C)

Measuring Range	User Configurable From 50 ppb 50,000 ppm C (Depending on Method)
Repeatability	+/- 2% (depending on Configuration)
Drift	Compensated, self-calibrated NDIR (+/- 2% non-accumulative)
Response time	From 3 minutes, depending on configuration
Display/Computer	Operator menu prompting Microsoft Windows.Net Operating System
Power Supply	110/220 VAC 10 Amp service recommended
Dimensions (HxWxD)	23x22.25x24.5 in. 57.5x55.6x61.2
Weight	131 lbs. 60 Kg.

Purchasing Specifications:

A) The Laboratory TOC Analyzer shall be completely automatic, having a built-in auto sampler with a capacity of 103 vials of 20 or 40 ml samples, a wash station & optional same station sample stirring to minimize volatile organic loss.

B) It shall have an advanced Microsoft Windows.Net PC based operation, data collection & diagnostics.

C) The PC shall have a serial communications port and parallel printer port.

D) Provided software must be menu driven, with flexible control of sample tagging & methods.

E) Data must be stored to electronics file, with easy download to printer & other PCs
..
F) There shall be no manual adjustments; automatic zero, span, and fault detection shall be included.

G) The NDIR shall be solid state, single beam, dual wavelengths, with no moving parts. The analyzer shall incorporate completely dual NDIRs to eliminate sample re-runs, re-dilutions, etc. caused by over-range or under-range conditions.

H) It shall be capable and supplied ready to perform both UV/Heated Persulfate Oxidation & (choose additional following methods) High Temperature Combustion Oxidation, Ozone Promoted and UV/NDIR Ultra-Pure analysis, if desired)

STARTOC OTHER BENCHTOP ANALYZERS

## SEMI-AUTOMATIC BENCHTOP TOC ANALYZER
(See Detailed Brochure)

StarTOC Semi-Automatic Benchtop TOC offers UV Persulfate and High Temperature Combustion Oxidation Methods & is a low-cost, accurate TOC analyzer which utilizes components and software from the StarTOC family of computer-controlled automated TOCs. Since operation and maintenance are very simple, this model may be the analyzer of choice when less than 20 samples per day are to be analyzed.

SOLIDS ANALYZER
(See Detailed Brochure)

True "Stand-Alone" Liquids, Solids & Slurry analysis, with Dual Reactor & Integral Dual NDIRs. Uses PC for automatic sample injection & data analysis.

TOC

BODc

CODc

Nitrate

Phosphate

Alkalinity

Turbidity

pH

Probes & Transmitters

Sample Systems
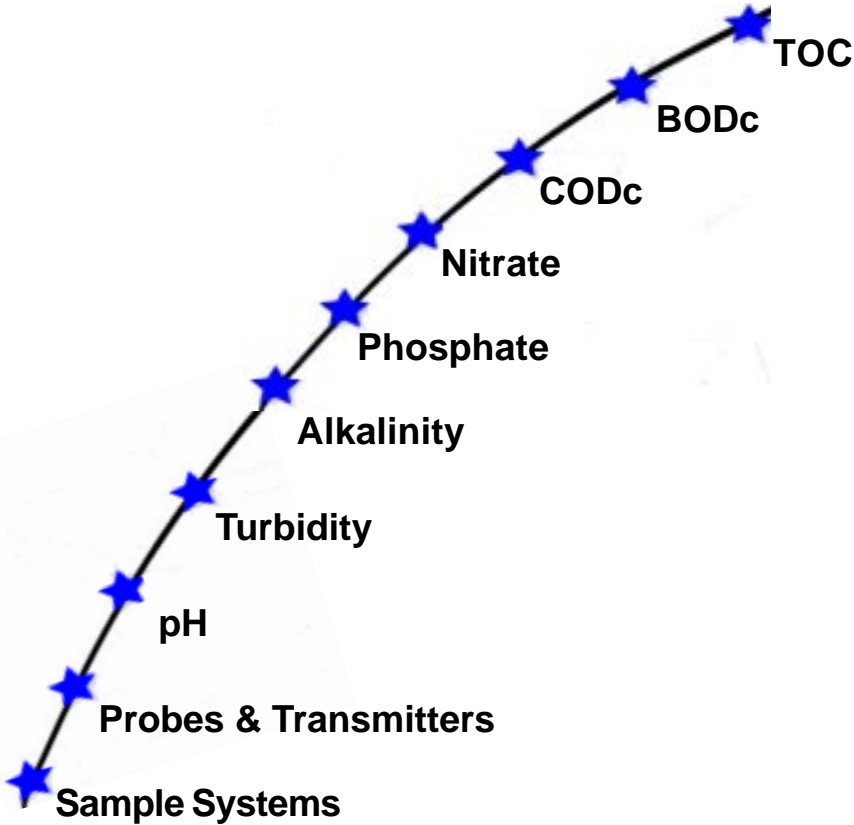
"Committed to keeping you on-line."

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Email: sales@tocsystemsinc.com

Pre-Engineered On-line System Packages and Enclosures

Pre-engineered and custom systems, including small shelters with all utilities installed and ready to be delivered to your site (see associated brochures).

- **Effluent Monitoring**

- **Waste Treatment**

- **Drinking Water**

- **Process Monitoring**

- **Panels & Small Shelters**

- **Custom Packages**