TOC SYSTEMS INC

StarTOC Solids

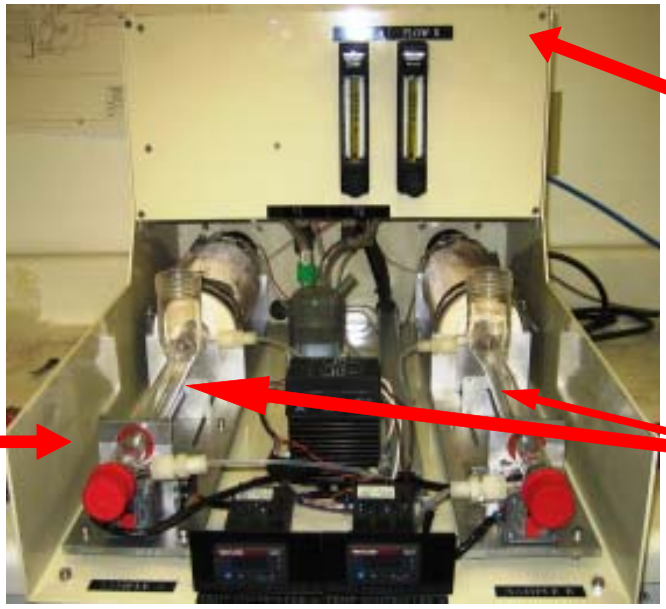
StarTOC Solids Plus Analyzer

Solids Slurries Sludge Liquids

Features

- ***Stand Alone with Dual NDIRs***
- ***Dual Reactors***
- ***Automatic Boat Injection***
- ***Scale with Computer Interface***
- ***TOC - Direct***
- ***TOC-Differential***
- ***Configurable Sample Size***

A True, Stand-Alone Solids, Slurries, Sludges & Liquids Analyzer
(Not Just an "Add-On" Module)



Dual NDIRs (allows solids & liquids analysis, independent of other laboratory equipment)

Computer Controlled Stepper for automatic sample introduction to each Reactor (eliminates operator error)

Dual Reactors

Description: StarTOC Solids/Liquid Analyzer provides a platform, which may be configured for a variety of applications, combustion temperatures, catalyst/non-catalyst choices and different Regulatory and Standard Methods. It is an ideal tool to support current development programs, as well as providing capability for any future mandated requirements.

Applications (partial)

- Solids, Slurry, Particulated Liquids
- Cleaning Validation (Swab Method)
- Combustors/Hazardous Waste Emissions
- Incinerator Residue
- Groundwater/Soil Contamination
- Agricultural Studies/Planning

Configurations

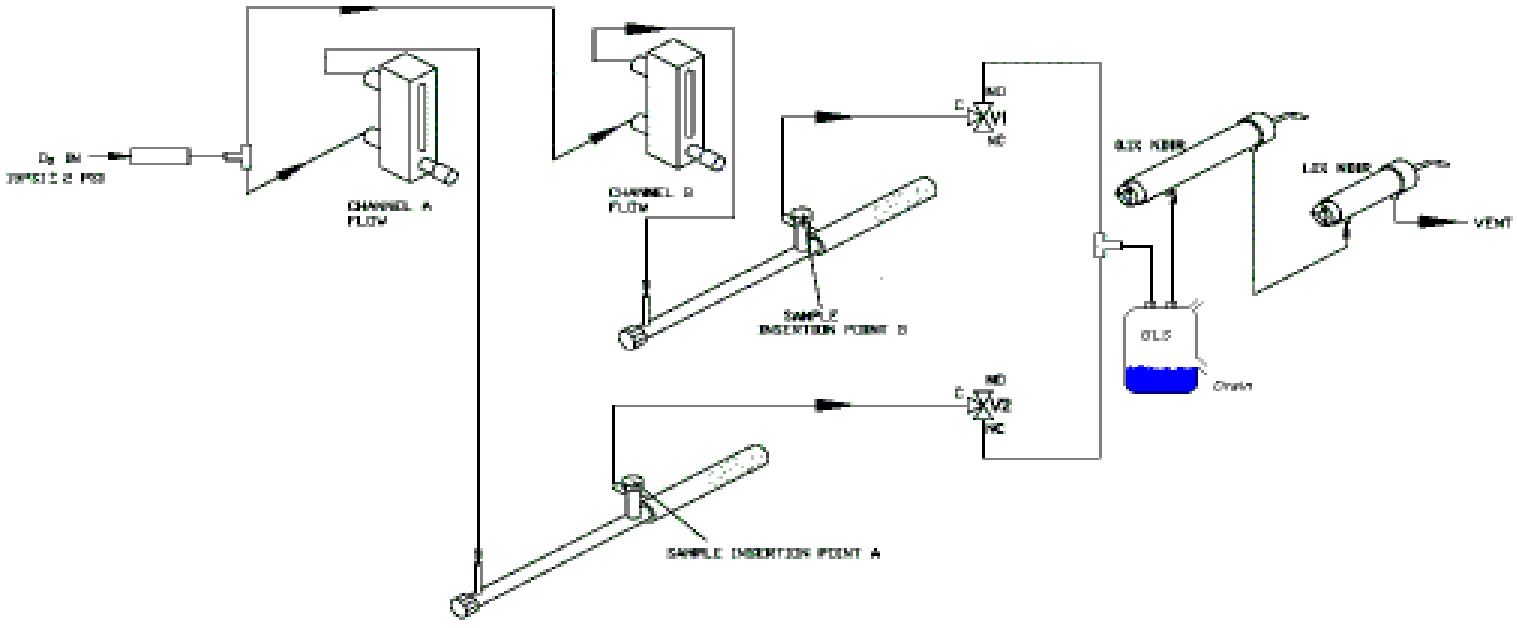
The hardware provides the operator with a high degree of flexibility to improvise the configuration parameters, such as temperatures, reactor catalyst choices or a non-catalytic reaction. The following two (2) methods are currently preferred.

- **TOC - Direct Mode**
  This method uses a single, dual-zone heated Reactor. The operator acidifies the sample, which is initially introduced to the 250°C heat zone, where all TIC is vaporized to CO_2 and measured as TIC. After TIC vaporization, the sample is automatically placed in the high temperature heat zone, where the TIC-Free sample is oxidized to CO2 and reported as TOC.

- **TOC Differential Mode**
  This method uses one Reactor, set to a high temperature, to combust all the carbon in the sample, to be reported as TC (Total Carbon).

  Another portion of the same sample is acidified and introduced to the Second Reactor, set to 250°C and is reported as TIC. The computer mathematically subtracts the TIC analysis from the TC analysis to derive TOC:

TOC = TC - TIC



Flow Diagram

Operation (Solids, Slurry, Sludge)

1. **Weigh Sample**
   (Sample Weight Automatically Entered)

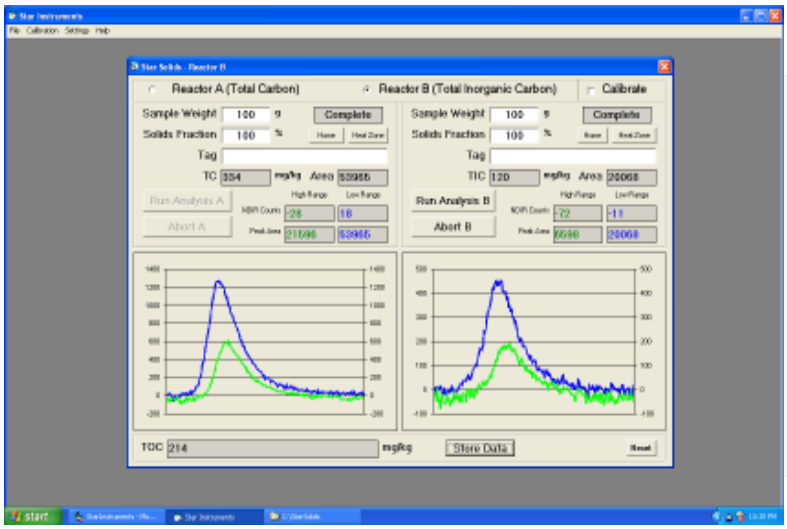
2. ***Enter Solids Fraction (Operator)***

3. ***Enter Sample Tag (Operator)***

4. ***Position Crucible on injector***

5. ***Sample Automatically Injected***

6. ***Automatic Analysis***



Operation (Liquids)

1. ***Dispense Specified Amount of Sample by Syringe***

2. ***Perform Same Functions as with Solids Analysis (above)***

Specifications: (Nominal)

Sample Size	**Configurable**
Reactor Temperature	**Adjustable up to 1000°C**
Range	**Set by Operator**
Response Time	**From 5 - 7 minutes (nominal)**
Power Supply	**110/220 VAC 10 Amp service recommended**
Dimensions (HxWxD)	**17 x 17 x 24 in.** **43 x43 x 61 cm.**
Weight	**40 lbs** **18 kg**

Purchase Specifications:

A) The Analyzer shall measure TOC and/or TIC in solids, slurries, sludge & liquids.

B) It shall have dual Furnaces & dual Reactors, each having operator temperature adjustments up to 1,000°C.

C) It shall have an independent automatic sample injection system on each Reactor, to eliminate rate of oxidation errors caused by non-regulated sample injection speed.

D) It shall incorporate Dual Solid State, Dual Wavelength Ratioing, Non-Dispersive Infrared Analyzers (NDIRs) to measure the Carbon Dioxide (CO_2) generated in the oxidation phase of analysis. The NDIRs shall be completely computer controlled and have no moving parts. It shall have a non-reflective, borosilicate sample cell, impervious to corrosion and be self-calibrated. It shall carry a 5 Year Warranty on the NDIR Sample Cell & a 2 Year Warranty on the Complete NDIR Bench.

E) High Temperature Combustion Method fully compliant with EPA 415.1 shall be used.

F) All software shall be included to operate the analyzer for both "TOC-Direct" & TOC-Differential". Software shall be easily installed on customer-furnished P.C. (or Star to provide P.C. as an Option). Software to be supported for life of the analyzer.

G) Star Part Number TB200, Digital Scale shall be furnished (Option). Digital Scale to be interfaced to P.C. to record sample weight automatically to maximize precision of analysis.

H) Analyzer shall be Star Instruments Model "StarTOC-Solids, Slurries, Sludge & Liquids" Analyzer.

TOC SYSTEMS' OTHER BENCHTOP ANALYZER SYSTEMS

AUTOMATIC TOC/TN ANALYZER

A Truly Automatic TOC Analyzer offering Five Oxidation Methods, 103 Sample & 1 Wash Stations, Septum Piercing Vortex Stirrer, Dual NDIRs & Easy Operation with Windows Software.

SEMI-AUTOMATIC BENCHTOP TOC ANALYZER

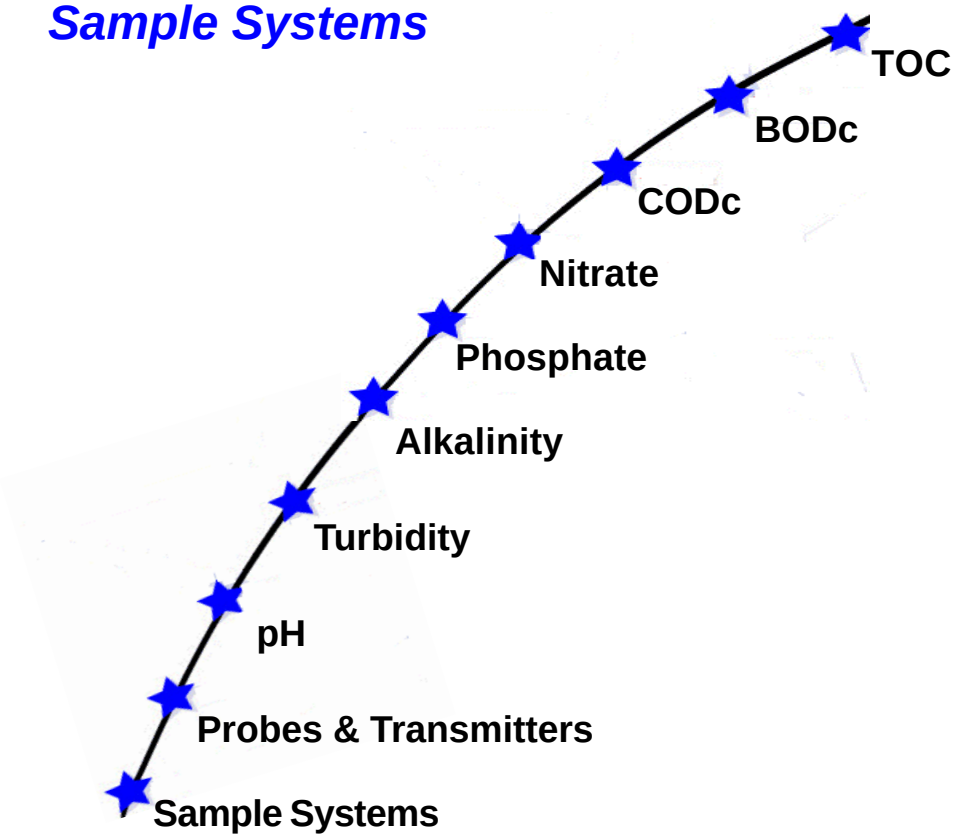
UV/HEATED PERSULFATE METHOD

&

HIGH TEMPERATURE COMBUSTION METHOD

A low-cost, accurate TOC analyzer utilizing components and software from TOC Systems' family of computer-controlled automated TOCs. Very simple operation and maintenance. May be the analyzer of choice when less than 30 samples per day are to be analyzed.

TOC Systems, Inc. also Offers Complete On-Line Analyzer & Sample Systems



"Committed to keeping you on-line."

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