

## TC and TOC Analysis of Liquids

### By Combustion and Coulometric Detection

**Applications include:** Water and wastewater, brines, process fluids, corrosive agents and acids.

**CONFORMS TO ASTM D 4129**



The **CM130 Total Carbon Analyzer** is a complete analytical system capable of measuring total carbon and total organic carbon in aqueous samples. Combining a high-temperature combustion furnace with a highly sensitive CO<sub>2</sub> detector, the CM130 is capable of analyzing samples containing carbon concentrations from ppm levels to 10,000 ugC (absolute) without user calibration. UIC's analyzers are rugged, accurate and adaptable to most TC/TOC applications. They are used extensively in industrial, research and educational laboratories worldwide. The CM130 system includes the following components pictured above:

#### CM5015 CO<sub>2</sub> Coulometer

- No user calibration
- Wide, linear dynamic range
- Readability to 0.01 ug Carbon
- User selectable display units
- 10" LCD Touch Screen
- SD Card data storage
- LIMS Compatible

#### CM5300 Horizontal Furnace with CM5321 Furnace Kit

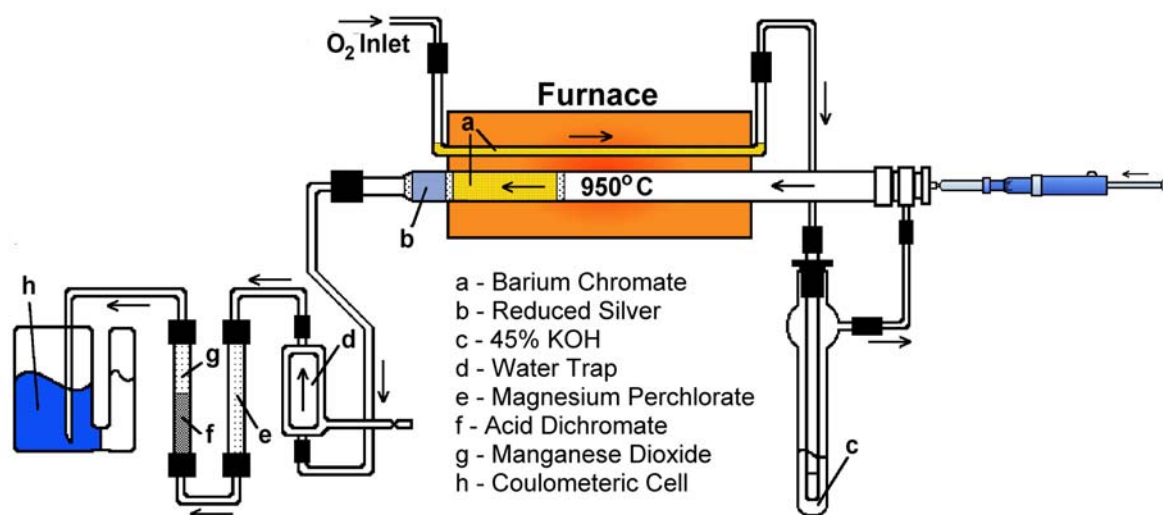
- Programmable up to 1100°C
- Pre-combustion scrubbers for removal of interferences from oxygen carrier gas
- Post-combustion scrubbers for removal of interfering gases formed during sample combustion
- Sample introduction using constant rate syringe

#### Instrument Capabilities

A major advantage of the CM130 TC/TOC Analyzer is the use of coulometric detection. Employing the principles of Faraday's Law, the CM5015 CO<sub>2</sub> Coulometer automatically measures the absolute mass amount of carbon dioxide resulting from sample combustion. No user-calibration is required and linear detection is available from less than 1 ug carbon to over 10,000 ug carbon. Using this 100% efficient coulometric process, relative standard deviations of 0.2% or better are common for standard material. For smaller concentrations, an absolute deviation of approximately 1 ug C is typical.

Users with samples containing particulates, solids or solid/liquid slurries should consider the CM120 or CM135 systems offered by UIC. Oxidation times vary with sample type and temperature although 5 to 7 minute analyses are typical.

## Principles of Operation



### Total Carbon

A variable volume, constant rate syringe is used to introduce the sample into the high temperature oxygen atmosphere (typically 950°C) within the sample combustion zone. In that environment, all carbon within the sample is rapidly oxidized to CO<sub>2</sub>. Interfering reaction products (including sulfur oxides, halides, water and nitrous oxides) are removed by the post-combustion scrubbers. The resulting carbon dioxide is then swept into the CM5015 CO<sub>2</sub> Coulometer where it is automatically measured using absolute coulometric titration.

### Total Organic Carbon

Prior to injection into the furnace, the sample is acidified and purged of CO<sub>2</sub> and carbonate carbons. This "pre-treated" sample is then reacted as described above.

### Data Handling

Names, weights and sizes of up to 50 samples can be entered, to be used by the CM5015 in calculating the final result. Analytical progress is displayed on the 10" LCD touch screen in user-selectable units. Detailed analysis information is automatically saved to an on-board SD card after each sample. Data can also be transmitted through the standard serial and Ethernet ports to be captured on a personal computer or LIMS. In addition, a detailed report can be printed to the optional small format printer while each sample is running.

## Ordering Information

### CM130 - Total Carbon / Total Organic Carbon in Liquids

**Includes:** CM5015 CO<sub>2</sub> Coulometer, CM5300 Horizontal Furnace, and CM5321 Furnace Kit with tools and accessories for the analysis of liquid samples. (P/N CM130-01 110V, 50/60Hz) (P/N CM130-02 220V, 50/60Hz)

### Optional Equipment:

**Printer** – 3" format impact printer. Includes cable, power supply, paper and ribbon. (P/N CM124-078)