

Exeter Analytical, Inc.

CE-440 Elemental Analyzer

Determining the Carbon, Hydrogen, Nitrogen, Oxygen, and Sulfur content of unknowns is one of the most basic and essential needs for any chemist.

If you measure CHN/O/S, then you can increase productivity and maximize confidence in your results with the CE 440 Elemental Analyzer. The CE 440 is designed to give you accurate, reliable results, no matter what sample types you analyze.

The CE 440 uses thermal conductivity detection for measuring carbon, hydrogen, and nitrogen, after combustion and reduction. This time-proven technique allows measurements to be made over a very wide range of concentrations.

An IBM-compatible PC controls all instrument functions and simplifies operation for consistent operator-to operator results.

**Only the CE 440 offers you all these advantages:**

**Accuracy and Precision** - The CE440 provides analytical data of unsurpassed accuracy and precision. The complete control of combustion parameters combined with steady state measurement of combustion products ensures a level of accuracy and precision that cannot be matched.

| <b>Sample Run</b>            | <b>%C</b>    | <b>%H</b>   | <b>%N</b>   |
|------------------------------|--------------|-------------|-------------|
| 1                            | 65.43        | 6.72        | 8.45        |
| 2                            | 65.47        | 6.73        | 8.45        |
| 3                            | 65.47        | 6.72        | 8.48        |
| 4                            | 65.45        | 6.70        | 8.44        |
| 5                            | 65.44        | 6.72        | 8.47        |
| 6                            | 65.50        | 6.72        | 8.52        |
| 7                            | 65.52        | 6.70        | 8.52        |
| 8                            | 65.48        | 6.70        | 8.49        |
| 9                            | 65.45        | 6.70        | 8.48        |
| 10                           | 65.49        | 6.71        | 8.48        |
| <b>Mean Values</b>           | <b>65.47</b> | <b>6.71</b> | <b>8.48</b> |
| <b>Theoretical Values</b>    | <b>65.44</b> | <b>6.71</b> | <b>8.45</b> |
| <b>Deviation from Theory</b> | <b>0.03</b>  | <b>0.00</b> | <b>0.03</b> |

**Versatility** - With its unique combination of both static and dynamic combustion, the CE 440 can combust the widest range of sample types of any CHN/O/S instrument. Our unique horizontal furnace allows for automatic removal of the residue from each sample after analysis, avoiding memory effects and gas flow problems, which can occur with vertical furnace systems.

**Reliability** - The CE440 is a fully automated CHN/O/S elemental analyzer. The system with its Windows™ based P.C. operating software has been designed to reduce human error through incorporation of extensive automation, customer help, and diagnostic facilities. Using the technique of steady-state measurement of combustion products, the CE 440 is inherently more reliable than gas chromatographic systems which are dependent on flow, column temperature, and dead volume management.

With the lowest operating cost of any elemental analyzer available, the CE 440 won't strain your budget. Low gas and reagent consumption combined with higher reduction tube life make it the most economical CHN/O/S elemental analyzer to operate.

Continuous diagnostics and automatic maintenance alerts make operation almost fool-proof. By monitoring signals, voltages, and sample throughput, the instrument provides you with continuous status reports on consumable reagents as well as an immediate warning should a problem occur. And, most parts are user-replaceable, further reducing cost and downtime.

### **CE440 Features**

- Rapid analysis for high productivity - analysis time of less than 5 minutes
- Unique combustion technique makes it possible to analyze any sample type, from volatiles to refractories
- Stable thermal conductivity detector provides linear response with superior precision and accuracy
- Windows<sup>®</sup> software with data storage for statistical analysis and flexible report generation
- Horizontal sample injection removes interfering residue between each sample run
- Continuous diagnostics with automatic maintenance alerts
- Low reagent consumption - industry's lowest cost per sample

## Widest Range of Applications

With its wide linear range, combined static/dynamic combustion and unique horizontal furnace design allowing for the removal of sample residue between runs, the CE 440 is capable of analyzing the widest range of sample types - quickly, easily, and reliably.

Typical applications include:

**Organics and Pharmaceuticals** - The CE 440 can analyze virtually any class of organics, including organometallics, heterocyclic nitrogen derivatives, steroids, polynuclear aromatics, and organophosphorous.

**Environmental** - Analyze the effects of fuels, oils, and their by-products on the environment, or study the composition of material retained by membranes used in oceanography, water filtration, and air monitoring.

**Polymers** - The CE 440 provides a fast, direct method for determining elemental composition of polymers, copolymers, and blends. Even samples with high levels of halogens, like PVC or Teflon<sup>R</sup>, can be analyzed rapidly and accurately.

**Refractories** - Nitrides, graphite fibers, and ceramics are easily analyzed - even carbides with melting points over 2000°C.

**Volatile/Air Sensitive Samples** - Volatile and air sensitive materials are easily analyzed using our capsule sealing device.

**Other Application Areas: Plastics, petrochemicals, agriculture, food, and pyrotechnical compounds.**

## Options to extend your capabilities

In addition to the automatic sample changer, Exeter Analytical, Inc. offers several other accessories to customize your system for your particular requirements:

- **Single Sample Automation** - If you only run a few samples at a time, this feature will let you manually introduce a sample, then it will run the analysis automatically.
- **Capsule Sealer** - This device ensures sample integrity by making a cold weld of the sample capsules. Analyzing highly volatile samples such as gasoline and oils becomes routine.
- **Refractory Materials Kit** - This kit contains fluxes and special sleeves for the combustion of difficult samples requiring rigorous conditions for extracting carbon and nitrogen.

## **SPECIFICATIONS**

**Accuracy:** With standard organic compounds, +/-0.15% absolute plus +/- 0.15% relative

**Sample Size:** Typically 1-5 mg; up to 500 mg for samples with low carbon content

**Analysis Time:** Less than 5 minutes for CHN

**Controller:** IBM-Compatible PC with Windows/Windows 95

**Automation:** 64 sample carousel, OR, single sample with ability to re-weigh for ash

**Range:** 100 ppm to 100%

**Detector:** Thermal conductivity

**System Sensitivity:** +/- 1 microvolt

**Analytical Sensitivity:** Less than 1 microgram

**Power:** 110/220 V, 60/50 Hz, 10 amp, single phase

**Weight:** 125 lbs. / 57 kg.

**Dimensions:** 32" wide x 28" deep x 13" high (81 x 71 x 33 cm)

**Bottled Gases Required:** Helium/Oxygen 99.99% purity