TruSpec® Elemental Determinators
Specification Sheet

Instrument Range @ 500 mg

Carbon	50 ppm or 0.005% to 50%
Hydrogen	200 ppm or 0.02% to 50%
Nitrogen	80 ppm or 0.008% to 100%

Precision Range @ 500 mg

Carbon	25 ppm or 0.5% RSD†
Hydrogen	100 ppm or 1% RSD†
Nitrogen	40 ppm or 0.5% RSD†

Readability 0.0001

Analysis Time 4 minutes

Sample Size up to 1 gram

Detection Method

Carbon/Hydrogen	Optimized, Low-Noise, Non-Dispersive Infrared Absorption
Nitrogen	Optimized, Low-Drift Thermal Conductivity (TC Cell) Detector

Gases Required

Carrier	Helium (99.99% pure) @ 35 psi ±10%
Combustion	Oxygen (99.99% pure) @ 35 psi ±10%
Pneumatic	Compressed air, source must be oil and water free; 40 psi ±10%

Furnace Resistance furnace; both primary and afterburner; up to 1050°C

Autoloader 30 position (stackable to 120 samples)

PC (Computer);

External	IBM compatible with Microsoft Windows® 2000; Pentium 733 MHz, 128 MB RAM (minimum); USB Interface

Dimensions

Width	27 inch (69 cm)
Height	31 inch (79 cm)
Depth	28 inch (71 cm)

Instrument Weight 250 lb. (113 kg)

Electrical Power Requirements

Determinator	230 V~ (+5%/-10%), 50/60 Hz, 12 Amps
Computer	115/230 V~ (±10%), 50/60 Hz, 5/3 Amps
Monitor	90 to 264 V~, 50/60 Hz, 1.6 Amps

Part Numbers

TRSNC	TruSpec N (Nitrogen only) with PC tower, Windows®-based operating software, flat panel monitor, and autoloader
TRSCNC	TruSpec CN (Carbon/Nitrogen) with PC tower, Windows®-based operating software, flat panel monitor, and autoloader
TRSCHNC	TruSpec CHN (Carbon/Hydrogen/Nitrogen) with PC tower, Windows®-based operating software, flat panel monitor, and autoloader

†Whichever is greater.
~denotes VAC under load.

Theory of Operation

The TruSpec Series is used to determine nitrogen, carbon/nitrogen, or carbon/hydrogen/nitrogen in many organic matrices. The system is based on the Dumas method of combustion, and provides a result within four minutes for all elements.

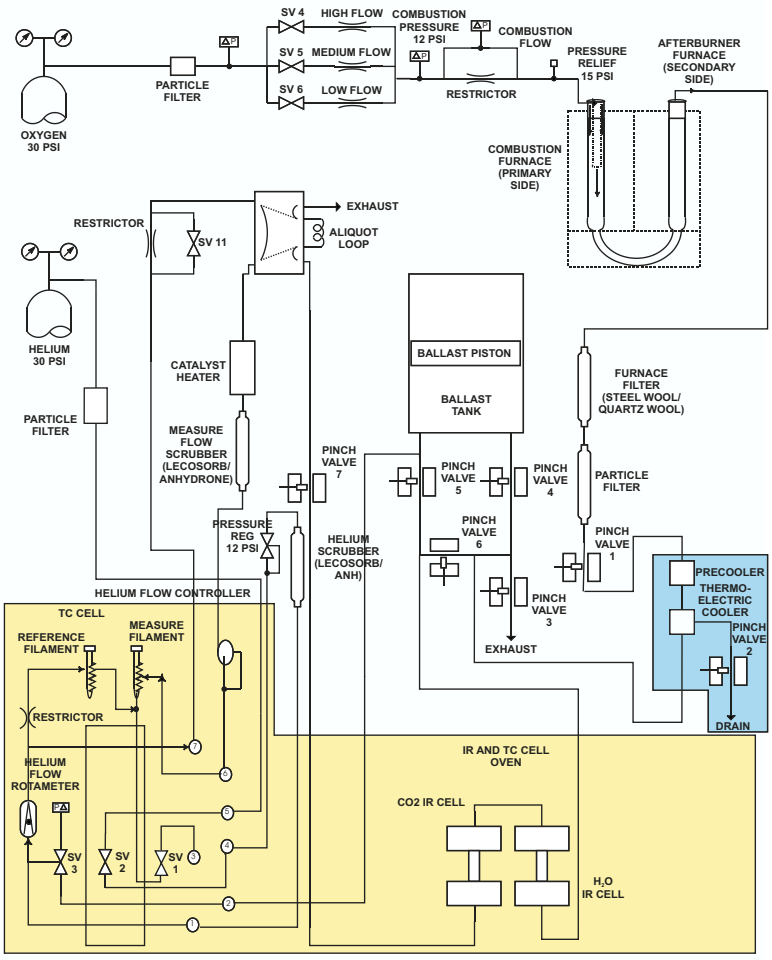
There are three phases during an analysis cycle: purge, burn, and analyze. In the sample-drop purge phase, the encapsulated sample is placed in the loading head, sealed, and purged of any atmospheric gases that have entered during sample loading. The ballast volume (zero volume at this point) and gas lines are also purged.

During the burn phase, the sample is dropped into the primary furnace (950°C) and flushed with pure oxygen for very rapid combustion. The products of combustion are passed through the after-burner furnace, furnace filter, pre-cooler, and thermoelectric cooler before collecting in the ballast volume.

In the analyze phase, the combustion gases in the ballast become homogeneous by means of passive mixing. A series of infrared detectors then measure the evolved gases for carbon and hydrogen. In addition, a 3 cc aliquot is captured in a loop before the ballast piston is forced down to evacuate the ballast. The sample aliquot gases are swept through hot copper to remove oxygen and change NOx to N_2, Lecosorb and Anhydrone to remove carbon dioxide and water, and a thermal conductivity detector to determine nitrogen. An optimized detector is used for each element—ensuring a total analysis time of less than four minutes.

The final result is displayed as weight percentage or in parts per million as determined by the operator. Results can be corrected on a moisture basis, and for % total protein.

The key to optimal performance of this instrument is the reliable autoloader (no mechanical motors), robust combustion tube (no co-mixing of combustion and carrier gases, ensuring 100% oxidation), and an efficient ballast/aliquot dosing system that significantly reduces cost-per-test and overall analysis time.



Specifications and part numbers may change.
Consult LECO for latest information.

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