

SC-144DR Sulfur/Carbon Determinator

Specification Sheet

Instrument Range at 350 mg*

Sulfur:	10 ppm or 0.001% to 26%
Carbon:	50 ppm or 0.005% to 100%

Precision

Sulfur:	≤1% RSD or ±5.0 ppm, whichever is greater
Carbon:	≤1% RSD or ±25 ppm, whichever is greater

Readability

1 ppm

Calibration

Single-point; Multi-point (linear, quadratic, cubic polynomial)

Analysis Time

90 seconds (nominal)

Sample Size

350 mg for coal (nominal)

Balance Readability and Range

0.0001 to 120 gram

Detection Method

Infrared

Chemical Reagent

Anhydrous Magnesium Perchlorate

Gas Required

Oxygen, 99.5% pure, 40 psi (2.8 bar), 3.5 lpm (purge flow); 2.5 lpm (analyze flow)

Furnace

400° to 1450°C; 1350°C nominal

Physical Dimensions[†]

Determinator: 24 in. H x 21.5 in. W x 22 in. D (61 x 55 x 56 cm)

Weights (Approximate)

Determinator: 170 lb. (78 kg)
Total Shipping: 220 lb. (100 kg)

Nominal Operating Conditions

Operating Temp: 59 to 95°F (15 to 35°C)
Relative Humidity: 20 to 80% (non-condensing)

Electrical Power Requirements

230 V~ (±10%; at max load), 50/60 Hz, single phase, 12A, 9,500 BTU/hr (idle), 19A, 15,000 BTU/hr (max)

Part Numbers

SC-144DRPC

SC-144DR Sulfur/Carbon Determinator with Windows® - based Software, Current PC Tower, and Monitor

Options

751-300-150
501-291

4-place Balance Kit
Oxygen Regulator

*Adjusting sample size may extend instrument range.

†Allow a 6-inch (15 cm) minimum access area around all units.
V~ denotes VAC.



Theory of Operation

The SC-144DR Sulfur and Carbon Analyzer is a software-controlled instrument designed to determine the carbon and sulfur content in a wide variety of organic materials such as coal, coke, and oils, as well as some inorganic materials such as soil, cement, and limestone by combustion and non-dispersive infrared detection.

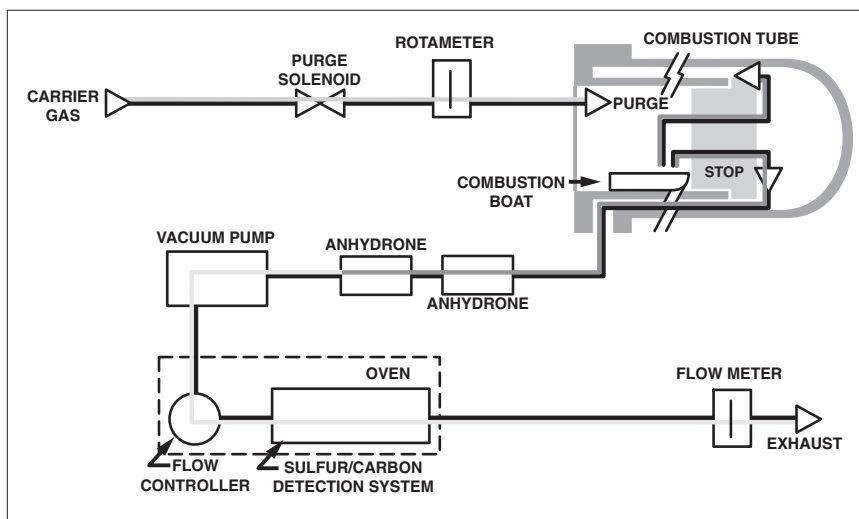
Analysis begins as a sample (0.350 g nominal) is weighed into a combustion boat. When Analyze is selected from the Samples menu, the sample is placed in a pure oxygen environment typically regulated at 1350°C. The combination of furnace temperature and oxygen flow causes the sample to combust. All sample materials contained in the combustion boat go through an oxidative-reduction process that causes carbon and sulfur bearing compounds to break down and free the carbon and sulfur. The carbon then oxidizes to form CO₂ and the sulfur forms SO₂. (The design of the combustion system prevents the atmosphere from entering the combustion zone.)

Sample gases are first swept through the boat stop to the back of the inner combustion tube, then forward between the inner and outer combustion tubes, allowing the sample gases to remain in the high temperature zone for a longer period and permit efficient oxidation.

From the combustion system, the gases flow through two anhydrous tubes to remove moisture, through a flow controller that sets the flow of sample gases through the infrared detection cell.

The carbon IR cell measures the concentration of carbon dioxide gas. The sulfur IR cell measures the concentration of sulfur dioxide gas. The instrument converts these values to a percentage/ppm value, using an equation preset in the software that takes into account the sample weight, calibration, and known moisture value.

Basic Flow Diagram



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

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