

CS744

Carbon/Sulfur Determinator

Specification Sheet

Instrument Range*	
Carbon:	0.002 mg** to 60 mg
Sulfur:	0.002 mg** to 17.5 mg
Precision†	
Carbon:	0.001 mg or 0.5 % RSD, whichever is greater when converted to absolute units (mg)
Sulfur:	0.001 mg or 1.5 % RSD, whichever is greater when converted to absolute units (mg)
Calibration	Standards (single or multipoint); manual
Analysis time§	40 s
Cycle Time§	130 s (including purge, analysis delay, and analysis time)
Throughput	27 samples/h (nominal)
Sample Size	1 g (nominal)
Detection Method	Non-Dispersive Infrared Absorption
Chemical Reagents	<ul style="list-style-type: none">• Anhydrous Magnesium Perchlorate (MgClO₄)• Sodium Hydroxide on an Inert Base‡• Rare Earth Copper Oxide‡• Platinized Silica Gel• Cellulose
Gas Requirements	Carrier: Oxygen, 99.5 % pure, 35 psi (2.41 bar) ±10 % Pneumatic: Compressed Air (oil, water free), 40 psi (2.76 bar) ±10 %
Gas Flow Rates	Carrier: 3 L/min Pneumatic: 1 L/analysis
Furnace	2.2 kW Induction
Operation Conditions	Operating Temp: 15 °C to 35 °C (59 °F to 95 °F) Rel. Humidity: 20 % to 80 % (non-condensing)
Sound Pressure Level	62 dBA excluding vacuum (max reading at operator's level per IEC/EN 61010-1)
Physical Dimensions††	33 in H x 26 in W x 30 in D (84 cm x 64 cm x 75 cm) with touch-screen monitor
Electrical Power Requirements	230 V~ (+10/-15 % at max load); 50/60 Hz, single phase, 25 A; 5500 Btu/h††
Weight (approx.)	308 lb (140 kg) with monitor 292 lb (132 kg) without monitor

Part Numbers

CS744-C	Carbon/Sulfur Determinator with software and external PC
C744-C	Carbon Determinator with software and external PC
S744-C	Sulfur Determinator with software and external PC

Options

NOTE: Multiple configurations of options are available. Please contact your local LECO Sales Engineer for more details.

- Optional mounted touch-screen monitor package (M)
- Optional automatic cleaner and tube removal package (H)
- Optional performance package (P)



- * Use the following formula to calculate element concentration: % element concentration = [(absolute element mass in mg)/(sample mass in mg)] * 100
- ** Lower range is calculated as 2 instrument blank deviation. Method range may differ due to factors such as sample type and method parameters.
- † Calculated as 1 instrument blank deviation. Method precision may differ due to sample inhomogeneity or other external factors.
- § All times listed are nominal, actual times may vary based on method settings and application.
- †† Allow for a 6 in (15 cm) minimum access area around all sides.
- ‡ With optional Performance Package
- ‡‡ Average output based on nominal operating parameters.

Theory of Operation

The CS744 carbon/sulfur analyzer is designed for wide-range measurement of carbon and sulfur content of metals, ores, ceramics, and other inorganic materials. The instrument features custom software designed specifically for touch operation.

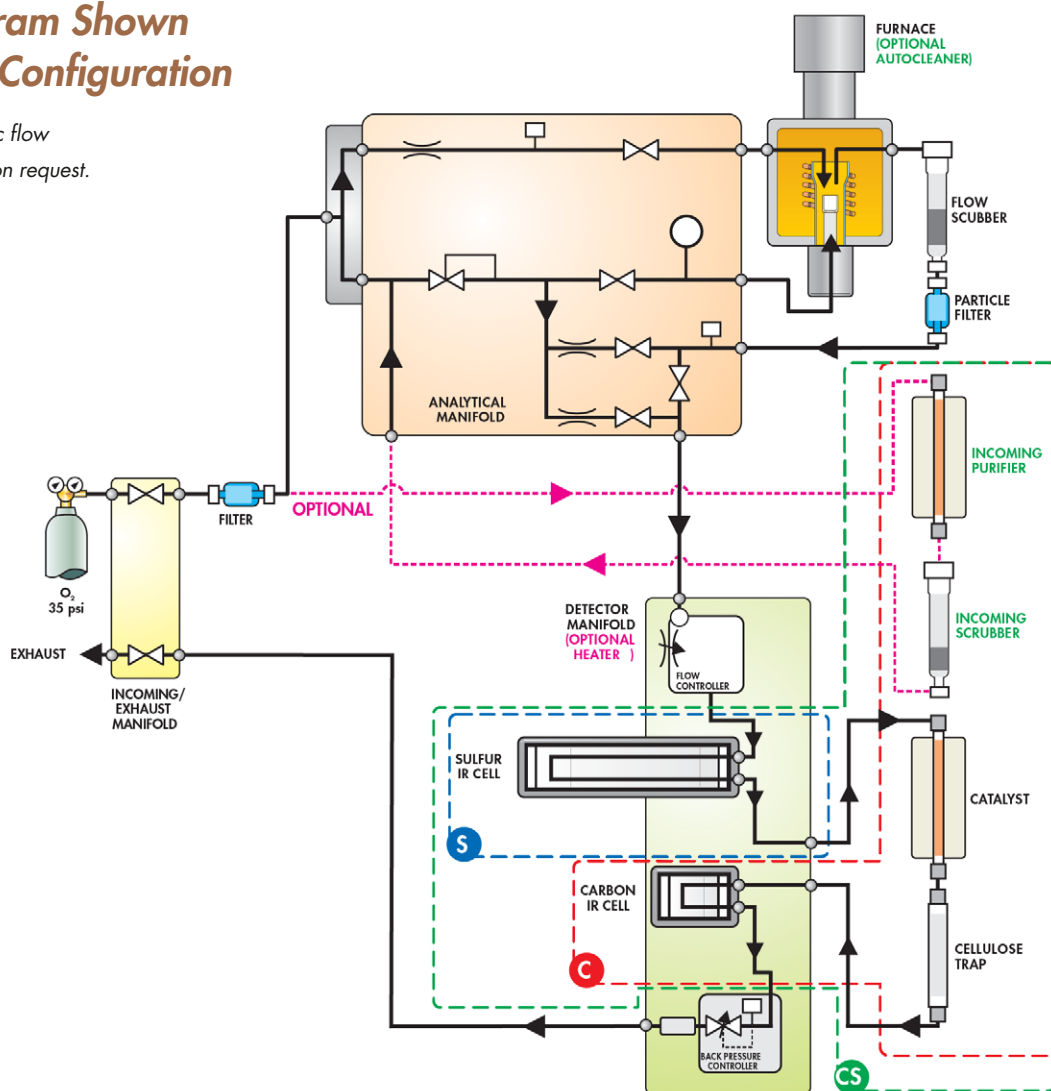
A pre-weighed sample of approximately 1 g is combusted in a stream of oxygen using RF induction to heat the sample. Carbon and sulfur present in the sample are oxidized to carbon dioxide (CO₂) and sulfur dioxide (SO₂), and swept by the oxygen carrier through a drying reagent and then through a non-dispersive infrared (NDIR) cell, where sulfur is detected as SO₂. The gas flow continues past a heated catalyst, where carbon monoxide (CO) is converted to CO₂ and where SO₂ is converted to sulfur trioxide (SO₃), which is subsequently removed by a filter. Carbon is then detected as CO₂ by another NDIR

cell. A pressure controller is used to maintain constant pressure in the NDIR cells so as to reduce interference from natural variations in atmospheric pressure. The final component in the flow stream is an electronic flow sensor, which is used for diagnostic purposes to monitor the carrier flow.

Non-dispersive infrared cells are based on the principle that CO₂ and SO₂ absorb infrared (IR) energy at unique wavelengths within the IR spectrum. Incident IR energy at these wavelengths is absorbed as the gases pass through IR absorption cells. The concentration of unknown samples is determined relative to calibration standards. To reduce interferences from instrument drift, reference measurements of pure carrier gas are made prior to each analysis.

Flow Diagram Shown for CS744 Configuration

Configuration-specific flow diagrams available on request.



Specifications and part numbers may change. Consult LECO for latest information. ISO-9001:2015 Q-994 | LECO is a registered trademark of LECO Corporation.

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