832 Series

Sufur/Carbon Determinator

Specification Sheet

Instrument Range *		**Precision** †	
Sulfur, 832: Sulfur, 832DR and 832HT: Carbon:	0.008 mg** to 30 mg 0.0035 mg** to 98 mg 0.0175 mg** to 200 mg	Sulfur, 832: Sulfur, 832DR and 832HT: Carbon:	0.004 mg or 1 % RSD, whichever is greater 0.0018 mg or 1 % RSD, whichever is greater 0.0088 mg or 1 % RSD, whichever is greater
Sample Mass	350 mg (nominal, coal)		
Analysis Time	60 s to 120 s nominal		
Detection Method	Non-Dispersive Infrared Absorption (NDIR)		
Chemical Reagents	Magnesium Perchlorate (Anhydrone)		
Gas Requirements	Oxygen, 99.5 % purity, 15 psi (1.0 bar) ±10 %		
Furnace. Resistance			
Base 832 and 832DR: 832HT:	500 °C†† to 1,450 °C, ±10 °C of setpoint 500 °C†† to 1,550 °C, ±10 °C of setpoint		
Operating Conditions	**Temp:** 15 °C to 35 °C (59 °F to 95 °F)	**Rel. Humidity:** 20 % to 80 %, non-condensing	
Sound Pressure Level	57 dBa (max reading at operator's level per IEC/EN 61010-1)		
Physical Dimensions ‡	80 cm H × 46 cm W × 79 {66‡‡} cm D	31.5 in H × 18 in W × 31 {26‡‡} in D	
Electrical Power	230 V~, 50/60 Hz, Single Phase; 12 A max, 4 A idle§		
Thermal Dissipation	**Idle:** 3,100 Btu/h§	**Analyzing:** 5,100 Btu/h§§	
Weight (approximate)	194 lb (88 kg) Analyzer with Monitor	172 lb (78 kg) without Monitor	

Part Numbers

SC832-MC	Sulfur/Carbon 832 instrument with CORNERSTONE® brand software, external PC, and touch-screen display
SC832-A	Sulfur/Carbon 832 instrument for add-on to an existing 744/844 Series Cornerstone Instrument system
S832-A	Sulfur 832 instrument for add-on to an existing Series Cornerstone Instrument system such as the 828 or 744/844 Series
SC832DR-MC	Dual Range Sulfur/Carbon 832 instrument with Cornerstone brand software, external PC, performance package, and touch-screen display
SC832HT-MC	High Temp Dual Range Sulfur/Carbon 832 instrument with Cornerstone brand software, external PC, performance package, and touch-screen display

Options

Multiple configurations of options are available. Please contact your local LECO Sales Engineer for more details Other Sulfur and/or Carbon configurations are available

Optional performance package (P); adds a segmented leak check and electronic back pressure flow control feature

Optional autoloader package (L); adds an autoloader with 100-sample capacity, see 832 Series Autoloader specification sheet for additional information (209-171-012)

* *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.*
†† *Furnace operation below 800 °C requires optional software registration. Contact LECO Service for more information.*
‡ *Allow for a 6 in (15 cm) minimum access area around the side of the instrument; space not required behind the instrument.*
‡‡ *Dimension from rear panel to front foot, reflects actual benchspace required.*
§ *Average at standby: 1,100 °C, gas off.*
§§ *Average at nominal operating parameters: 1,350 °C, gas on, 30 samples/h.*

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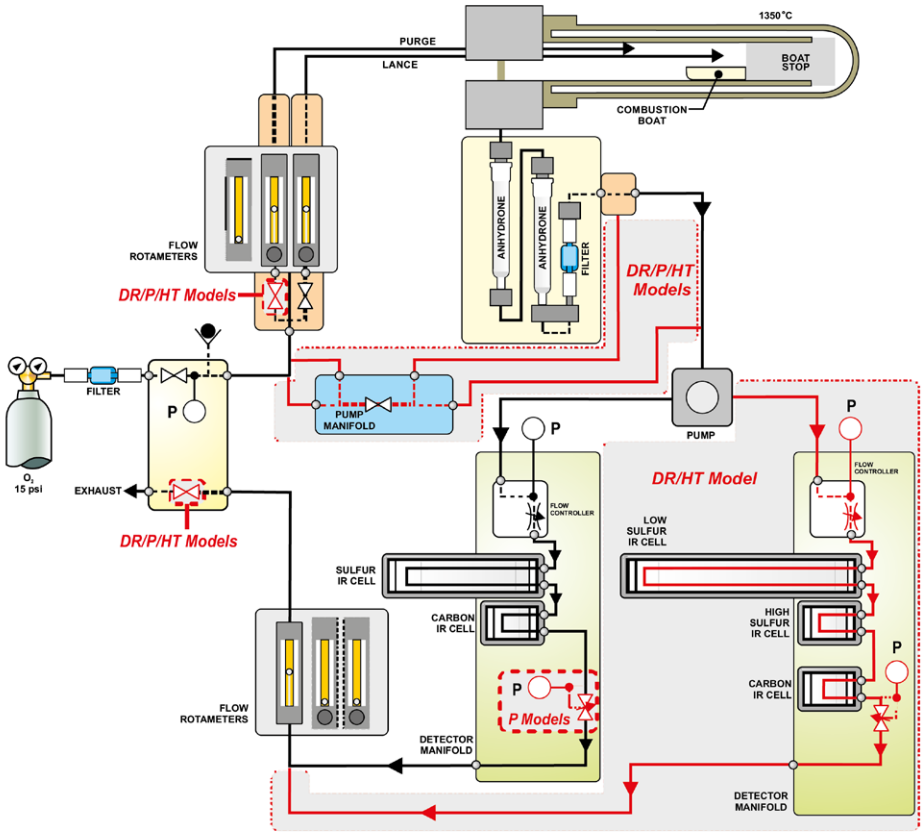
Theory of Operation

The 832 Series of Elemental Determinators are specifically designed to determine the sulfur and carbon content in a wide variety of organic materials such as coal, coke and fuel oils, as well as some inorganic materials such as soils, cements and limestone by high temperature combustion with non-dispersive infrared detection (NDIR).

Analysis begins when a sample is weighed into a combustion boat and placed into the furnace, which is typically operated at 1,350 °C. To ensure complete combustion of the sample, the furnace environment is composed of pure oxygen. The carbon in the sample oxidizes to CO_2 gas, and sulfur oxides to SO_2 gas. After a preset time, additional oxygen is introduced directly above the sample via a ceramic lance to accelerate the combustion of refractory materials. The combustion gases are swept to the back of the furnace then forward between the inner and outer furnace tubes. This allows the gases to remain in the high temperature zone, ensuring efficient oxidation. Upon exiting the furnace, the combustion gases flow through anhydrone tubes for moisture removal. Next, the flow controller regulates the flow as the gases are carried through the NDIR cells for sulfur and/or carbon detection. Non-dispersive infrared cells are based on the principle that CO_2 and SO_2 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 with the absorption being dependent upon the path length of the cell. The Dual Range (DR) sulfur 832 model has a wider sulfur range due to a short and long path length IR cells provided for measurement of high and low range sulfur signals. The software automatically selects which cell to use for optimum measurement in the 832DR model. The concentration of unknown samples is determined relative to calibration standards.

An external PC with LECO Cornerstone brand software manages all of the quantitative calculations and saves all of the data.

Composite Flow Diagram



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