

# O836 Oxygen

## Specification Sheet



<b>Instrument Range*</b>	0.00005** to 50 mg (1 g sample)	
<b>Precision†</b>	0.000025 mg or 0.3% RSD, whichever is greater	
<b>Analysis Time</b>	85 seconds (including outgas, purge, and analysis delay)	
<b>Cycle Time</b>	180 seconds (nominal)	
<b>Calibration</b>	Standards (single or multi-point); manual; gas dose	
<b>Sample Size</b>	1 g (nominal)	
<b>Detection Method</b>	Non-Dispersive Infrared Absorption	
<b>Chemical Reagents</b>	<ul style="list-style-type: none"><li>Anhydrous Magnesium Perchlorate (MgClO<sub>4</sub>)</li><li>Sodium Hydroxide on an Inert Base</li></ul>	<ul style="list-style-type: none"><li>Rare Earth Copper Oxide, Copper Turnings</li><li>Oxygen/Moisture Indicating Tube</li></ul>
<b>Gas Requirements</b>		
Carrier:	He: (99.99% pure), 22 psi (1.5 bar) ±5%	Ar: (99.999% pure), 22 psi (1.5 bar) ±5%
Pneumatic:	Compressed Air, 40 psi (2.8 bar) ±10%, source must be oil and water free	
<b>Gases Optional</b>		
Gas Dose:	Carbon Dioxide, 99.99% pure, 20 psi (1.4 bar) ±10%	
<b>Gas Flow Rates</b>		
Carrier:	460 cc/minute	
Pneumatic:	280 cc/analysis	
<b>Furnace</b>	Impulse furnace with current and power control 7500 Watts maximum, liquid cooled	
<b>Coolant</b>	3.2 L LECO Coolant	
<b>Operating Conditions</b>		
Temperature	15 to 35°C (59 to 95°F)	
Rel. Humidity	20 to 80%, non-condensing	
<b>Dimensions††</b>		
Height:	36 in. (91.5 cm) nominal; 39.25 in. (100 cm) with load head cover lift engaged	
Width:	27.75 in. (71 cm)	
Depth:	30 in. (76 cm) without monitor; 31.5 in. (80 cm) with attached touch-screen monitor	
<b>Electrical Power</b>	230 V~ (+10/-15%; at max load); 50A, 50/60 Hz, Single Phase; 12,500 BTU/hr†	
<b>Weight (approximate)</b>	Analyzer: 410 lb. (186 kg) without touch-screen monitor	

\*Use the following formula to calculate element concentration:

$$\% \text{ element concentration} = ((\text{absolute element mass in mg})/(\text{sample mass in mg})) * 100$$

\*\*Lower range is calculated as 2  $\sigma$  instrument blank deviation. Method range may differ due to factors such as sample type and method parameters.

†Calculated as 1  $\sigma$  instrument blank deviation. Method precision may differ due to sample inhomogeneity or other external factors.

††Allow for a 6 in. (15 cm) minimum access area around all sides.

†Average output based on nominal operating parameters.

V~ denotes VAC.

## Part Numbers

O836-MC	○ w/PC and touch-screen
O836-C	○ w/PC
O836-HC	○ w/PC and autocleaner
O836-HMC	○ w/PC, touch-screen, and autocleaner

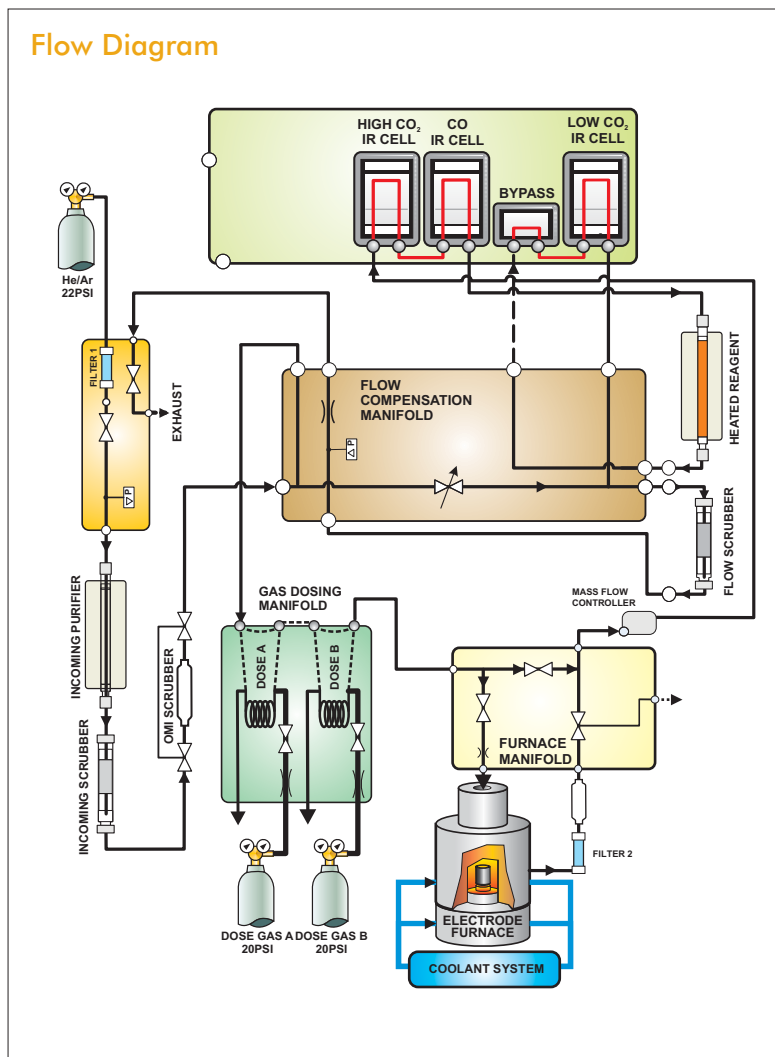
## Theory of Operation

The O836 Oxygen system is designed for wide-range measurement of oxygen content of steel, refractory metals, and other inorganic materials. The instrument features custom MS Windows®-based software designed specifically for touch operation.

A pre-weighed sample is placed in a graphite crucible which is then heated in an impulse furnace to release analyte gases. An inert gas carrier, typically helium, sweeps the liberated analyte gases out of the furnace and through a Mass Flow Controller to a series of detectors. Oxygen present in the sample reacts with the graphite crucible to form CO and CO<sub>2</sub>, which are detected using non-dispersive infrared (NDIR) cells. The gas then flows through a heated reagent, where the CO is oxidized to form CO<sub>2</sub>, and H<sub>2</sub> is oxidized to form H<sub>2</sub>O. The gas then continues through another set of NDIR cells where CO<sub>2</sub> is again detected. These analytes are then scrubbed out of the carrier gas stream.

The detection system is comprised of NDIR detectors. NDIR cells are based on the principle that CO and CO<sub>2</sub> absorb infrared (IR) energy at unique wavelengths within the IR spectrum. Incident IR energy at these wavelengths is absorbed as the gases pass through the IR absorption cells. The complete set of CO and CO<sub>2</sub> NDIR cells is required to give the most accurate oxygen results for a wide range of sample types and concentrations. The concentration of an unknown sample is determined relative to calibration standards. To reduce interferences from instrument drift, NDIR reference measurements of pure carrier gas are made prior to each analysis.

Flow Diagram



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

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