AMA254 Advanced Mercury Analyzer

Specification Sheet

Instrument Range @ 100 mg	Mercury: 0.5 ppb to 5 ppm (0.05 to 500 ng absolute)	
Precision	Mercury: 0.25 ppb or ≤ 5% RSD, whichever is greater	
Readability	0.1 ppb	
Calibration	Standard samples; linear, quadratic, cubic polynomial	
Analysis Time	5 minutes	
Nominal Sample Size	Solids: 100 mg	Liquids: 100 µl
Wavelength	253.65 nm	
Interference Filter	254 nm, half-width 9 nm	
Detector	Silicon UV diode	
Environmental Conditions	Operating Temp: 0°C to 35°C (32°F to 95°F)	Humidity: 20% to 80%, non-condensing
Gases Required	Carrier: Oxygen, 99.5%, 30 psi (2.1 bar), 160 to 180 ml/minute	
Electrical Requirements	230 V~ (±10%; at max load), 50/60 Hz, single phase, 7.8A; 6,200 BTU/hr	
Dimensions	28.5 in. L x 8.9 in. H x 18.2 in. W (72 cm x 23 cm x 46 cm)	
Weight (approx.)	144 lb. (65 kg)	Shipping Weight (approx.): 187 lb. (85 kg)

Part Numbers	
AMA254B	Mercury Analyzer with Computer and Monitor

Options	
AL254*	42-position Automatic Liquid Autoloader
AS254*	44-position Automatic Solid Autoloader
621-434-110	Color Inkjet Printer

V~ denotes VAC.
**Throughput is dependent upon boat size.*

Delivering the Right Results

Theory of Operation

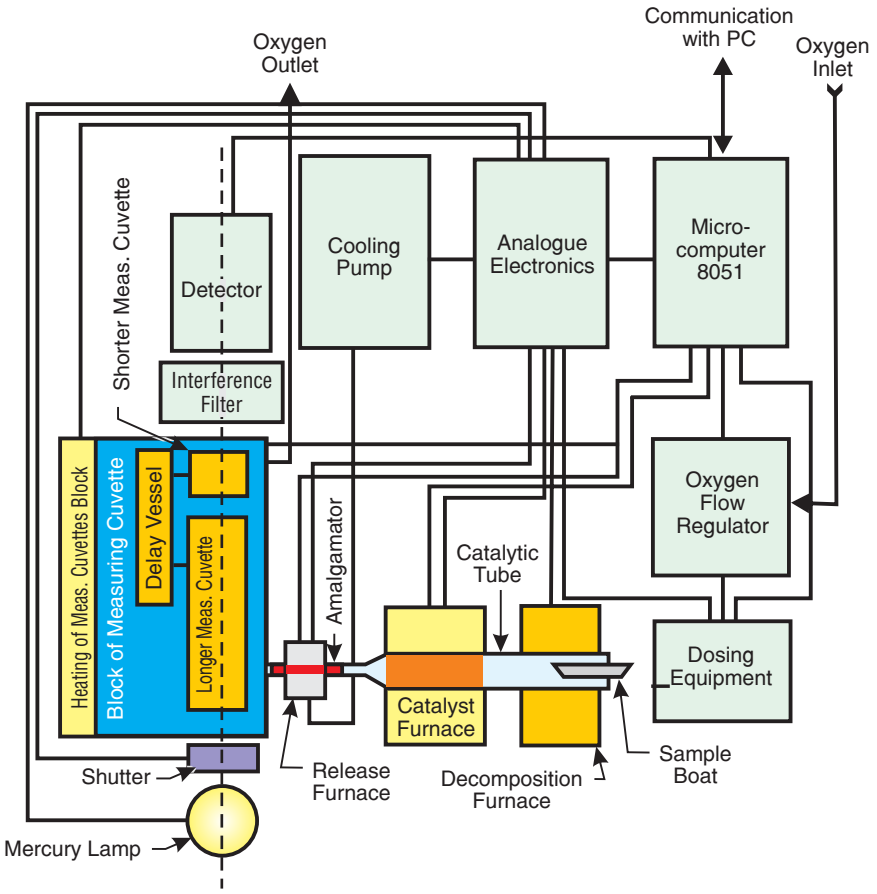
The AMA254 Advanced Mercury Analyzer is a unique Atomic Absorption Spectrometer that is specifically designed to determine total mercury content in various solids and liquids—without sample pre-treatment or sample pre-concentration. Designed with a front-end combustion tube that is ideal for the decomposition of difficult matrices like coal, combustion residues, soils, and fish, the instrument's operation may be separated into three phases during any given analysis: Decomposition, Collection, and Detection.

The first stage of an analysis is known as the Decomposition phase. During this phase, a sample container with a nominal amount of the matrix is placed inside a pre-packed combustion tube. This combustion tube—heated to ~750°C through an external coil—provides the necessary thermal decomposition of the sample into a gaseous form. The evolved gases are then transported (via an oxygen carrier gas) to the other side of the combustion tube. This portion of the tube, pre-packed with specific catalytic compounds, represents the area in the instrument where all interfering impurities (i.e. ash, moisture, halogens, and minerals) are removed from the evolved gases.

Following decomposition, the cleaned, evolved gas is transported to the amalgamator for the Collection phase of the system. The amalgamator, a small glass tube containing gold-plated ceramics, collects all of the mercury in the vapor. With a strong affinity for mercury and a significantly lower temperature than the decomposition phase, the amalgamator is capable of trapping all mercury for subsequent detection. When all mercury has been collected from the evolved gases, the amalgamator is heated to ~900°C—essentially releasing all mercury vapor to the detection system.

The released mercury vapor is transported to the final phase of the analysis—the Detection phase. During the Detection phase, all vapor passes through two sections of an apparatus known as a cuvette. The cuvette is positioned in the path length of a standard Atomic Absorption Spectrometer. This Spectrometer uses an element-specific lamp that emits light at a wavelength of 253.7 nm, and a silicon UV diode detector for mercury quantitation.

Flow Diagram



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

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