



## RA-915 Lab

Direct thermal decomposition laboratory mercury analyzer with Zeeman background correction

- Direct analysis of solids, liquids, and biosamples
- Low limit of detection
- Highest selectivity
- Unique analytical range
- Low maintenance, low operating costs
- Fast analysis
- Flexible operation modes
- User friendly software

# Easy-to-use versatile instrument for your applications

Mercury is an extremely toxic ubiquitous pollutant. There is a broad range of anthropogenic sources of mercury emissions to air and releases to water and soil. Mercury accumulates in deponent media and food chains and causes adverse effects on the environment and human health if consumed or inhaled.

The Minamata Convention on Mercury prescribes reducing mercury usage in various products and processes, monitoring and control of mercury emissions to air and releases to land and water. Formidable diversity of samples requires precise, cost effective instrument for fast, interference-free mercury analysis.

Lumex Instruments embraces the demand for accurate, reliable and easy-to-use laboratory mercury analyzer for the broadest range of applications possible and presents the new direct fully automated mercury analyzer RA-915 Lab.



RA-915 Lab  
with 45 position autosampler

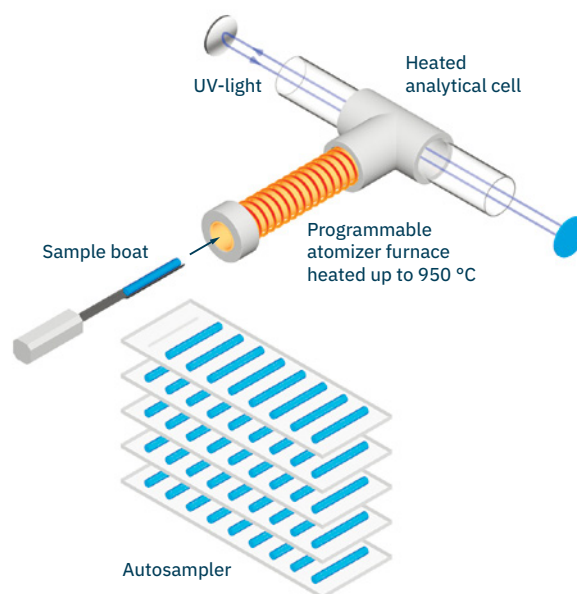
## Direct measurement, outstanding performance

### PRINCIPLE OF OPERATION

A weighed sample in a sample boat is introduced into the RA-915 Lab furnace by autosampler or manually. The sample is decomposed according to programmable temperature mode, and gaseous products are carried by purified air into a heated analytical cell.

The atomic absorption spectrometer with Zeeman correction for background absorption measures absorption of the 254 nm resonance radiation by mercury atoms.

The whole pathway from furnace compartment to the exhaust of the cell is heated to prevent mercury recombination with pyrolysis products such as chlorine and others. The special cell construction prevents optical windows contamination and minimizes the maintenance.



### FEATURES AND BENEFITS

- No sample pretreatment, no reagents, almost no wastes
- No compressed gases (oxygen or argon), air is used as a carrier gas
- No pre-concentration on gold traps
- Unmatched versatility – solid, semisolid and liquid samples, any kind of sorbent traps are analyzed directly
- Fast and cost effective analyses
- PC controlled programmable furnace temperature enables optimal decomposition mode for any kind of samples and makes study of mercury thermospeciation possible
- Automatic closed-loop temperature control function expands measurement range and prevents data loss for samples with high mercury concentration
- No memory effect: a sample with low mercury concentration can be analyzed right after one having high mercury content

# Sensitive and selective analysis without matrix effects

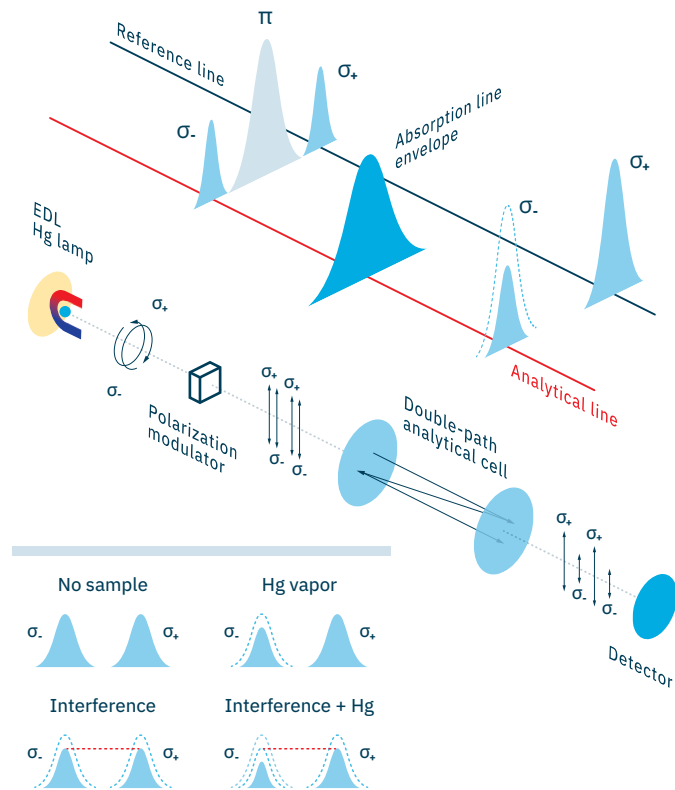
Lumex Instruments' state-of-the-art technology of Atomic absorption spectrometry with Zeeman correction for background absorption makes interference-free measurements easy and quick. Extended analytical range of up to 2 000 000 ppb ( $\mu\text{g}/\text{kg}$ ) covers all possible applications and samples.

## PRINCIPLE OF ZEEMAN BACKGROUND CORRECTION

A radiation source of the analyzer is placed in a strong permanent magnetic field. The mercury resonance line is split into three polarized Zeeman components. A photodetector detects only the radiation of the  $\sigma$ -components, one of those falling within the absorption line profile and another one lying outside.

When mercury is absent in the analytical cell, the radiation intensities of both  $\sigma$ -components are equal. When absorbing atoms appear in the cell, the difference between the intensities of the  $\sigma$ -components increases proportionally to number of the atoms.

The spectral shift of the  $\sigma$ -components is significantly narrower than the widths of molecular absorption bands. Therefore, the background absorption by interfering components does not affect analyzer's readings.



## Applications

Direct determination of the mercury concentration in solids, liquids, and traps for natural gas and stack gases

- soils, sediments
- rocks, ores, minerals
- crude oil, oil products, naphtha, petrochemicals
- coal, coke, fly ash, gypsum
- waste waters, wastes, sludge
- food, nutritional additives, animal feedstuff
- biosamples: tissues, hair, urine, blood, etc.
- drugs and cosmetics, plastics, fertilizers, raw materials

## STANDARDS

Mercury analysis with RA-915 Lab fully complies with globally applied standards:

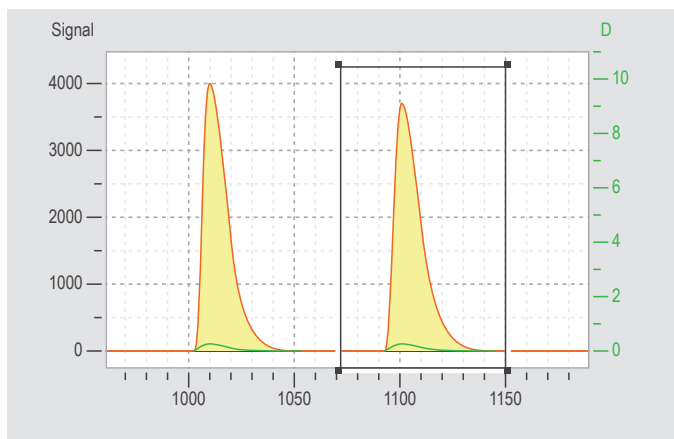
- ASTM D5954, D6722, D7622
- ISO 6978, ISO 20552
- US EPA methods PS12B, 30B, 7473
- EN/TS 17286, UOP 938

Not all standards are listed. Ask Lumex Instruments about your specific application.

# Software

Powerful, user-friendly RAPID software fully complies with FDA 21 CFR part 11 requirements.

- User level management and electronic signatures support
- Real-time visualization of selective and non-selective absorbance
- Adjustable modes for thermal decomposition of specific matrices
- Automatic closed-loop temperature control extends dynamic range and ensures no data loss due to high selective or non-selective absorbance
- Databases for storage, processing and reporting calibrations and measurement data



## SPECIFICATIONS

Measurement principle	Atomic absorption spectrometry at 254 nm with Zeeman correction of background absorption
Measurement range	0–2 000 000 ppb (µg/kg)
Detection limit	0.2 ppb (µg/kg)
Sample boat capacity	10–5 000 mg / 10–2 800 µL
Analysis time	1–5 min
Thermoscanning range	50–950 °C
Autosampler capacity	45 samples
Power supply	110–242 V, 50/60 Hz, 450 VA (peak consumption 1 300 VA)
Dimensions	441×770×455 mm (W×D×H), 441×450 mm footprint area 441×450×455 mm without autosampler
Weight	49 kg 40 kg without autosampler

## WARRANTY

RA-915 Lab mercury analyzer is covered by 12-month limited warranty.

## SERVICES

Upon request installation and commissioning of the RA-915 Lab mercury analyzer can be carried out on customer's site by our service engineers. Highly qualified application specialists provide support and training of operators, as well as adaptation of methods to customer's specific needs.



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