



# Mercury Analyzer

WA-5A / 5F

PERFECT SOLUTION TO TODAY'S  
ULTRA-TRACE LEVEL MERCURY  
ANALYSIS FOR GASEOUS MATRICES.

**DUAL-GOLD  
AMALGAMATION**



COMES AVAILABLE IN CHOICE OF ATOMIC ABSORPTION  
OR ATOMIC FLUORESCENCE SPECTROSCOPY DETECTOR



# Dual Gold amalgamation system achieves high precision

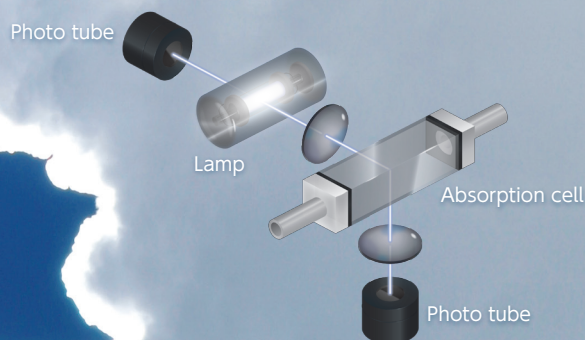
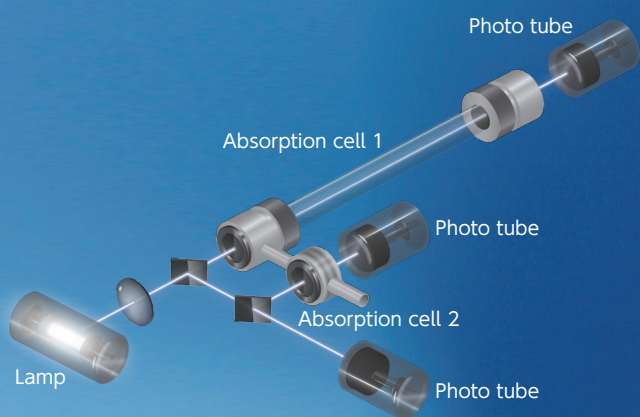
NIC Model WA-5 mercury analyzer is specially designed for measurement of Mercury in air and gaseous matrices (eg. hydrocarbon gases like Natural Gas, Shale Gas, LPG/LNG and more) in compliance with widely established and accepted technique of Gold-Amalgamation and detection by Atomic Spectroscopy – with the choice of either Atomic Absorption (AA) or Atomic Fluorescence (AF). Model WA-5 presents many unique levels of automation and functions to help laboratory accomplishes productivity, unmatched versatility, efficiency and operational labor saving. Model WA-5 is compact in design to allow for easy transport for field operation and measurements.



## Choice of 2 atomic spectroscopy detectors - satisfying all required test methods and applications

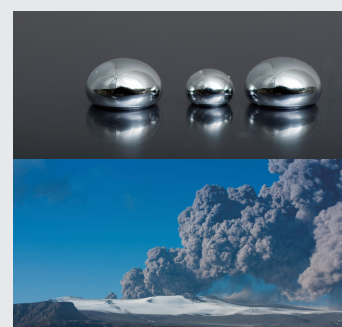
### Atomic Absorption System

### Atomic Fluorescence System



## MERCURY IN OUR ENVIRONMENT

Mercury is a naturally occurring toxic heavy metal that is present in trace amounts in all environmental media. Natural mercury is mobilized into air and water through earth activities such as volcanoes, earthquakes and forest fires while human activities have led to an increase mobilization in mercury with onset of industrialization. The bulk of global mercury in the atmosphere is elemental mercury in vapor form, with concentration ranging from a few nanograms per cubic meter (ng/m<sup>3</sup>) to micrograms per cubic meter (ug/m<sup>3</sup>) depending on its closeness to any stationary emission sources. Elemental mercury vapor is least water reactive therefore able to persist in the ambient air and travel over a long distance before depositing. From the atmosphere, mercury elements are deposited into the earth through precipitation into waterways, soils and vegetations. Mercury ended in the water bodies may undergo a complicated cycle of biotransformation bioconcentration and bioaccumulation, depending on the ecology conditions. Ultimately, this atmospheric mercury deposition is shown to relate to the rise of elevated levels of organic-mercury (methyl-mercury) in fish





# Selective Option Attachments – Multi-Configurable

## WA-5A or 5F standalone

WA-5A or 5F standalone operates on dual-gold-amalgamation. Gaseous samples are first collected onto the sampling tubes and manually inserted before measured by WA-5. Direct injection via gas-tight syringe is also possible.

**Applications** Mercury in Atmospheric Air, Exhaust Gas, Natural Gas, Shale Gas, Hydrocarbon Gas, LPG/LNG, Hydrogen Gas and more

**Test methods** AAS : ASTM 5954, ISO 6978, ISO 20552, JLPGA-S-07 & etc.  
AFS : ASTM 6350, ISO 6978, JLPGA-S-07, ISO 20552, USEPA IO-5 & etc



## Model TC-WA Auto tube changer (30positions)

WA-5A or 5F can be coupled with TC-WA 30-positions tube autosampler. Sampling tubes are set in TC-WA for unmanned fully automated tube desorption, 2nd-amalgamation and measurement on WA-5. Manual direct injection via gas-tight syringe is also possible.

**Applications** Mercury in Atmospheric Air, Exhaust Gas, Natural Gas, Shale Gas, Hydrocarbon Gas, LPG/LNG, Hydrogen Gas and more

**Test methods** AAS : ASTM 5954, ISO 6978, ISO 20552, JLPGA-S-07 & etc.  
AFS : ASTM 6350, ISO 6978, JLPGA-S-07, ISO 20552, USEPA IO-5 & etc



## Heated Vaporizer for LPG Cylinder

WA-5A or 5F standalone can be setup to operate with auto-sampling of gaseous hydrocarbon samples from Tedlar Bags input with Gas Volume Meter measuring the sampling volumes. Samples are collected as dual-gold amalgamation before measured on WA-5. Direct injection via gas-tight syringe is also possible.

WA-5A or 5F standalone can be coupled with LP-WA Liquefied Gas Vaporizer to directly collect the compressed gaseous hydrocarbon sample in the cylinder onto the gold-amalgamation sampling tube, with the gas volume measured by a Gas Volume Meter. Collected sample is sequentially auto-desorb to transfer to 2nd-gold amalgamation before measured on WA-5. Direct injection via gas-tight syringe is also possible.

**Applications** Mercury in Natural Gas, Shale Gas, Hydrocarbon Gas, LPG/LNG, Hydrogen Gas and more

**Test methods** AAS : ASTM 5954, ISO 6978, JLPGA-S-07 & etc.  
AFS : ASTM 6350, ISO 6978, JLPGA-S-07, & etc



## Other Accessories

**MB-1**  
Mercury Vapor Calibration Box



**PS-4**  
Re-Chargeable Sampling Pump



**S-MA**  
Manual attachment (20mL)



**M-160**  
Mercury Collector Tube



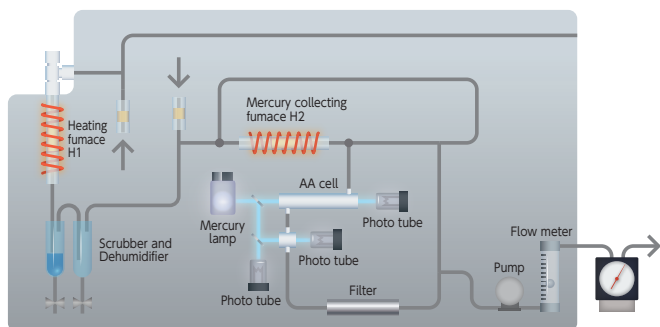
as it magnifies up the aquatic food chain, where predatory fishes and mammals (including human being) ingesting the fishes are risked to inherit the mercury. With the increase global industrialization, emission as a form of mercury has increased and making it a truly global concern.

Mercury is also naturally present in fossil fuel deposit in the earth crust such as crude oils, natural gas and shale gas. Natural gas has been already increasingly used as an energy source for power generation, household heating gas and automobile fuels while liquefied petroleum gas (LPG), which is a product of crude oil refining, is utilized as household cooking gas. Mercury is reactive to various metal materials such as Aluminum, Copper, Zinc, Brass, Nickel and more which if not properly treated, causes corruptions and eventual industrial catastrophic failures and accidents. Similarly, gases usage in household, mercury is present as a source of toxic exposures to the humans.

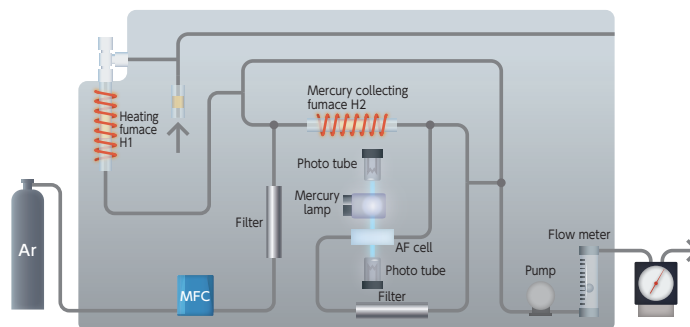


## SCHEMATIC DIAGRAM

### WA-5A (Atomic Absorption System)



### WA-5F (Atomic Fluorescence System)



## APPLICATIONS/TEST METHOD

|                        | Applications  | AAS Methods   | AFS Methods                                   |
|------------------------|---|---|---|
| Gas analysis           | Ambient air, Working environment air, Fuel gas, Natural Gas, Shale Gas, LPG and more. | ASTM D 5954-98; ISO 6978, ISO 20552, JLPGA-5-07, Manual method of measuring hazardous air pollutants. | ASTM 6350-98; ISO 6978, ISO 20552, USEPA IO-5 |
| Reduction vaporization | Drinking Water, River water, Sea Water, Waste water, Digested Liquid and more.        | USEPA 245.1, 245.2, 245.5, 7470A, 7471B, ASTM D 3223-02, EN 1483; APHA 3112, JIS K0102.               | USEPA 245.7; 1631e; ISO 17825;                |

## SPECIFICATIONS

|                                | WA-5A (Atomic Absorption System) | WA-5F (Atomic Fluorescence System)  |   |
|--------------------------------|----------------------------------|---|---|
| Mercury collector furnace part | Scrubber and Dehumidifier        | Electronic (Peltier) Cooling  |   |
|                                | Mercury collector furnace        | Heat up to 700°C  |   |
|                                | Filter (1)                       | Gold filter   |   |
|                                | Filter (2)                       | Activated carbon filter   |   |
|                                | Pump                             | Diaphragm Air Pump  |   |
|                                | Flow rate                        | 0.1 ~ 1.0L / min (Adjustable)   | 0.1 ~ 1.0L / min (Digital Mass Flow Controller)   |
| Detector part                  | Principle                        | Atomic Absorption Spectroscopy (Dual-Cell Auto Range)   | Atomic Fluorescence Spectroscopy  |
|                                | Light source                     | Low pressure Mercury discharge lamp   | Low pressure Mercury discharge lamp   |
|                                | Wavelength                       | 253.7nm   | 253.7nm   |
|                                | Detectors                        | Photo tube  | Photo tube  |
|                                | Carrier Gas                      | Ambient (Purified) Air  | Purified Argon (99.995% or better)  |
|                                | Detection Limit                  | 0.001ng (1pg)   | <0.1pg  |
|                                | Working range                    | 0.001 ~ 1000ng  | 0.0001 ~ 1000ng<br>LOW Mode (0 ~ 10ng) ,<br>HIGH Mode (10ng ~ 1,000ng) selectable             |
|                                | Display                          | Peak wave shape, Calibration curve, Measuring condition, Measuring results, Error message etc | Peak wave shape, Calibration curve, Measuring condition, Measuring results, Error message etc |
|                                | Communication                    | Ethernet  | Ethernet  |
|                                | Power supply                     | AC100 ~ 240V±5%, 50 / 60Hz, 170VA   | AC100 ~ 240V±5%, 50 / 60Hz, 170VA   |
|                                | Installation dimensions          | W230×D460×H390 (WA-5 unit only)   | W230×D460×H390 (WA-5 unit only)   |
| Weight                         | 13 kg (WA-5 unit only)           | 13 kg (WA-5 unit only)  |   |

## OPTIONAL ACCESSORIES

Heated Vaporizer for LPG Cylinder (Model LP-WA)  
 Model TC-WA Auto tube changer (30positions)  
 Manual Reducing Vaporization attachment (20mL) (S-MA)  
 Mercury Vapor Calibration Box (MB-1)

Sampling pump (PS-4)  
 Dry Gas Meter  
 Mercury collector tube (M-160) 5pcs / box  
 Carrying case for WA-5 unit

**NIC** Nippon Instruments Corporation

Identify the right mercury analyzer for you



Distributors





**Wolflabs**

# Wolf Laboratories Limited

[www.wolflabs.co.uk](http://www.wolflabs.co.uk)

Tel: 01759 301142

Fax: 01759 301143

[sales@wolflabs.co.uk](mailto:sales@wolflabs.co.uk)



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