NIC

Mercury Analyzer

WA-5A / 5F

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

DUAL-GOLD AMALGAMATION

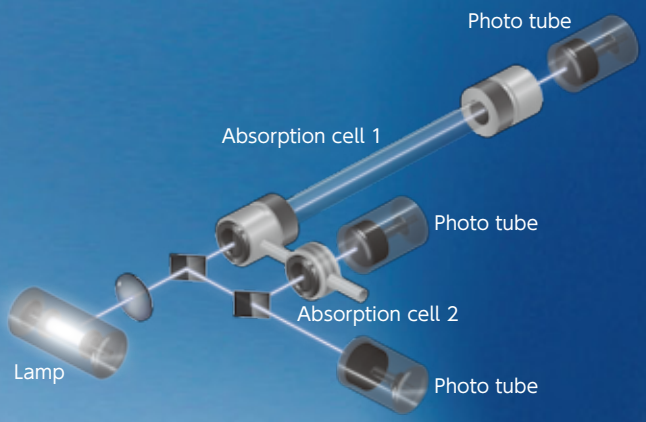
COMES AVAILABLE IN CHOICE OF ATOMIC ABSORPTION OR ATOMIC FLUORESCENCE SPECTROSCOPY DETECTOR

Dual Gold amalgamation system achieves high precision

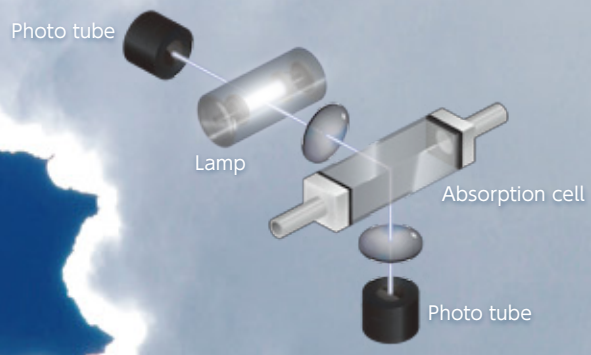
NIC Model WA-5 mercury analyzer is specially designed for measurement of Mercury in air and gaseous matrices (eg. hydrocarbon gases like Natural Gas, Shale Gas, LPG/LNG and more) in compliance with widely established and accepted technique of Gold-Amalgamation and detection by Atomic Spectroscopy – with 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/m3) to micrograms per cubic meter (ug/m3) 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)

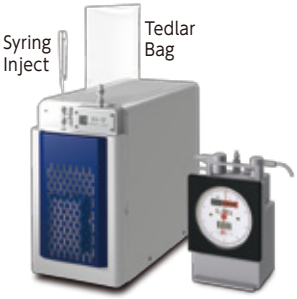
WA-5A or 5F can be coupled with TC-WA 30-positions tube autosampler. Sampling tubes are set in TC-WA for unmanned fully automated tube desorption, 2nd-amalgamation and measurement on WA-5. Manual direct injection via gas-tight syringe is also possible.

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.



Tedlar bag pic

Dry Gas Meter pic

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)

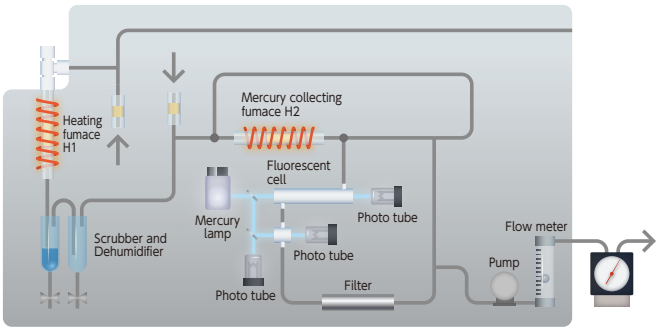
M-160
Mercury Collector Tube

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.

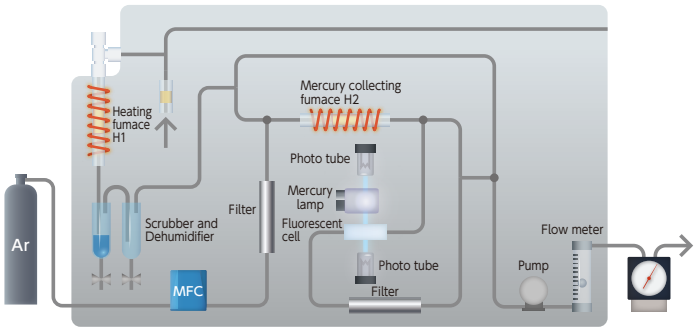
Mercury is also naturally present in fossil fuel deposit in the earth crust such as crude oils, natural gas and shale gas. Natural gas has been already increasingly used as an energy source for power generation, household heating gas and automobile fuels while liquefied petroleum gas (LPG), which is 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 corrosions 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-S-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;

SPECFICATIONS

		WA-5A (Atomic Absorption System)	WA-5F (Atomic Fluorescence System)
Mercury collector furnance part	Scrubber and Dehumidifier	Electronic (Peltier) Cooling	Electronic (Peltier) Cooling (optional)
	Mercury collector furnance	Heat up to 700℃	Heat up to 700℃
	Filter (1)	Gold filter	Gold filter
	Filter (2)	Activated carbon filter	Activated carbon filter
	Pump	Diaphragm Air 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 LOW Mode (0～10ng), 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 (Model ?????)
Mercury collector tube (M-160) 5pcs／box
Carrying case for WA-5 unit

NIC Nippon Instruments Corporation

Identify the right mercury analyzer for you
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ISO 14001 : 2004 CERTIFIED Tech-center, Factory & Osaka office/2007. 6. 8

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