



# Portable Mercury Monitor for Stack Gas

SGM-9

Mobile  
Ease of Setup

Compact and  
light-weight

Speciation  
Ready

Continuous  
monitoring



## Revolutionizing Mercury Measurements in Stack Gas

# The importance of measuring mercury in flue gases emissions

Monitoring of mercury emissions from stack has become more critical after the official induction of Minamata Convention Treaty on Mercury in 2017. Mercury is a persistent and toxic element that, through anthropogenic activities or natural processes, can be mobilized from natural deposits into the biosphere. Mercury emitted from primary anthropogenic sources mainly derives from high temperature industrial processes, during the high-temperature production of industrial goods and combustion of fuels, entering the ambient air with exhaust gases. Mercury emitted into the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microorganisms can change it into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. With Minamata Treaty objective being as "To protect the Human Health and Environment from Anthropogenic Emissions and release of Mercury and Mercury compounds", the action on global monitoring and regulation of Mercury emissions has to be effected.



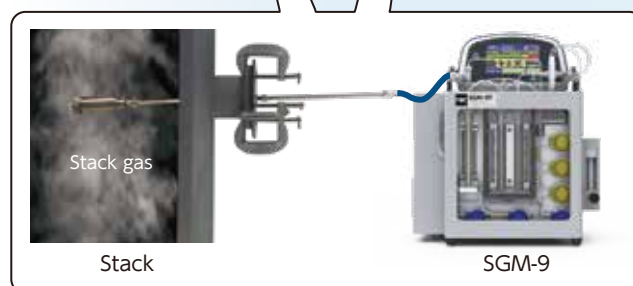
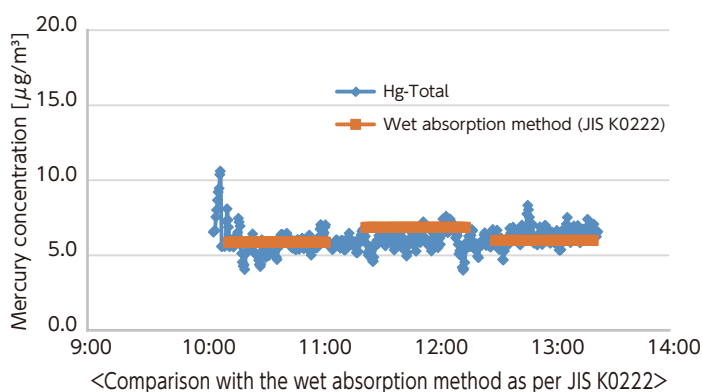
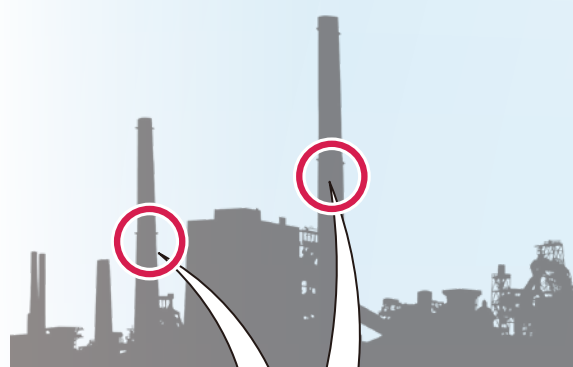
## NIC SGM-9 - Quick, Ease & Accurate for On-Site Real-Time Gaseous Mercury Sampling and Measurements

### High mobility achieved by its compact design

With its compact, light body, the SGM-9 is easy to transport and setup for operation at any sites. Minimum installation space, suitable for any elevation, operate without need for any sophisticated utility - just operate with standard electricity supply.

Simple yet innovative universal (non-Flange mounted) sampling probe allows measurements to be taken at any location sampling port within the facility.

Unlike the wet-absorption-method, real-time gaseous mercury reading can be obtained throughout the sampling and measurement period.

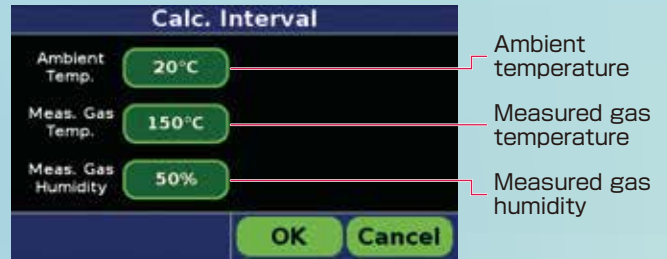


# Smart and Intuitive Reagents Exchange Function

Renewed software allow system to intelligently calculates and determine the optimum liquid dispensing/discharging exchange frequency, ensuring reductant and scrubbing reagents always function at its highest efficiency.

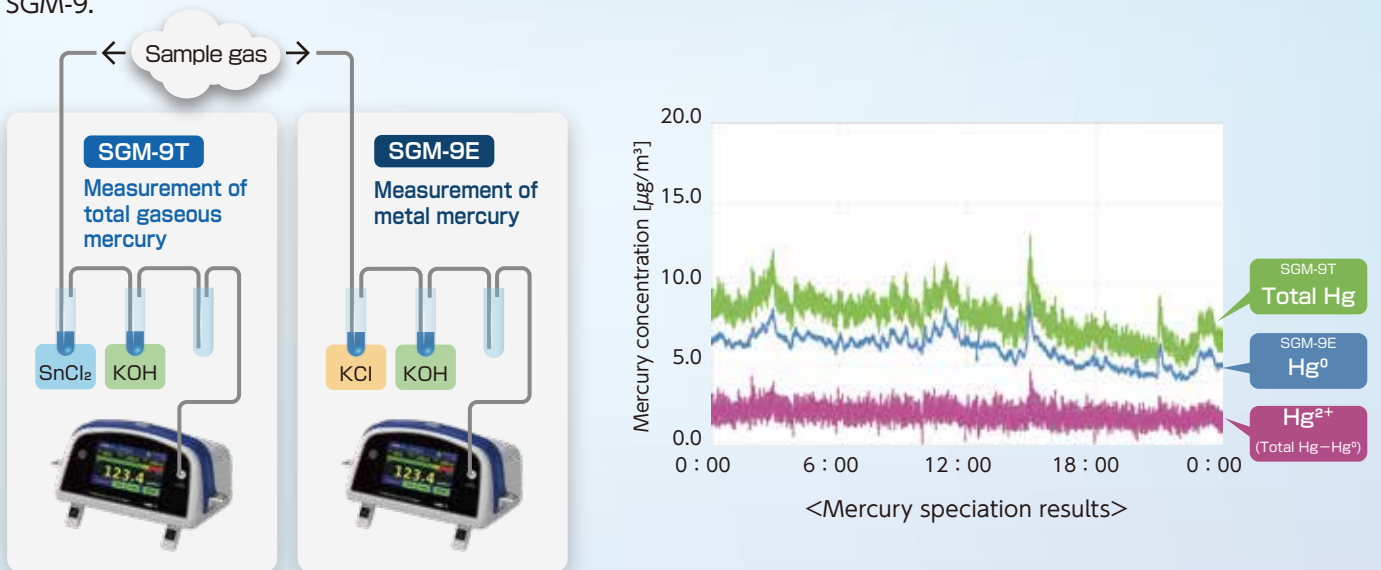
By simply entering on-site conditions (ambient temperature, measured gas humidity, and measured gas temperature), system automatically set the timing and volume of discharging liquid from the gas scrubbing bottles.

Furthermore, an reagent circulation pump function has been added to reduce the intermittent spiked peaks caused by condensation.



# Versatile extension for Speciation measurements

Compact, yet with high extensibility, the SGM-9 is capable to perform real-time speciation measurements on both elemental mercury and total gaseous mercury simultaneously with simple combination of two setup of SGM-9.

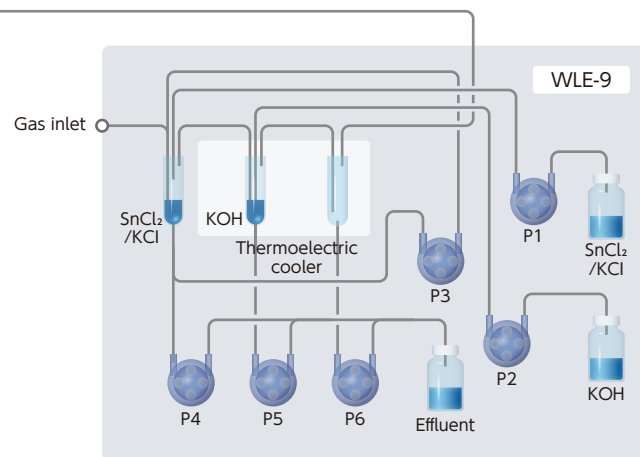
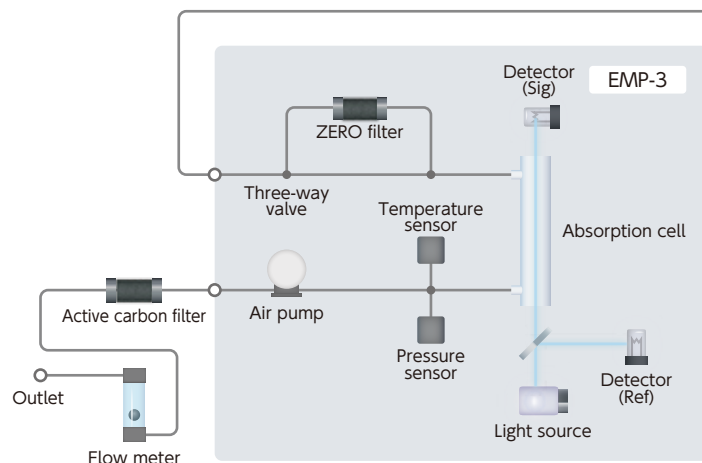


# Applications & Usage

With its versatility, SGM-9 is widely used for various applications.

- Research studies on mercury behavior in flue gases
- Mercury process monitoring
- Engineering test to evaluate the effectiveness of mercury control technologies
- Regulate injection/feed rates of mercury control technologies such as activated carbon, FGD additives, oxidation chemicals, etc.
- Gauge effects of process changes on mercury emissions levels
- Access to real-time data when using sorbent traps for compliance measurements

## Process flow diagram (SGM-9)



### Specifications (SGM-9 Detector EMP-3)

Measuring principle	Non-dispersive double-beam cold vapor atomic absorption spectrometry
Light source	Low-pressure mercury discharge tube
Detector	Semiconductor detector (with a 254 nm band-pass filter)
Detection limit	0.1 $\mu\text{g}/\text{Nm}^3$ (EMP-3 as a separate unit)
Measuring range	0-2000 $\mu\text{g}/\text{Nm}^3$ ; 0-20000 $\mu\text{g}/\text{Nm}^3$ (*) * when used with an option
Flow rate during measurement	$\sim 1$ L/min
Precision	RSD 3% (2 $\mu\text{g}/\text{Nm}^3$ or higher) without an option
90% response time	Within 5 seconds
Zero correction	Automatic zero correction
Resolution	STATIC mode (Stationary mode): 0.1 $\mu\text{g}/\text{Nm}^3$ ( $\sim 2,000$ ) MOBILE mode (Portable mode): 1 $\mu\text{g}/\text{Nm}^3$
Display	4.3-inch color LCD (480 x 272 pixels, 16.77 million colors)
Operation	Touchscreen
Onscreen data	Instantaneous value, average value, maximum value, trend graph (on a specified time scale), level gauge (linked with an alarm setting)
Data logging	Saved in CSV files or in the internal memory (retained for about 20,000 hours)
Data output	USB flash drive
Alarm method	Alarm buzzer and screen blinking (The alarm setpoint is configurable.)
Other functions	Temperature compensation, pressure compensation, GPS information recording
Power source	Dedicated nickel hydride battery (continuous operation: 5.5 hours at 25° C)
Operating conditions	Temperature: 0-45° C, humidity: 10-80%RH (No dew condensation)
Dimensions, weight	207W x 115D x 140H, 1.6kg (including the battery)
Standard accessories	Probe, probe filter (x1), battery (x1), battery charger, shoulder/waist belt, USB flash drive

### Specifications (SGM-9 Gas Treatment System WLE-9)

Samples	Total mercury in stack gas, elemental mercury in stack gas
Power source	100-240 VAC, 50/60Hz (EMP-3's power is also supplied from WLE)
Reagent dispensing	Reagent filling pump x 2, reagent circulation pump x 1, discharge pump x 3
Gas scrubbing bottles	1st bottle: 10w/v% stannous chloride solution (6 ml)* or 1mol/L KCL solution (6 ml)* 2nd bottle: 1mol/L potassium hydroxide solution (6 ml)* 3rd bottle: Empty bottle for dehumidification
Dehumidification method	Thermoelectric cooling method
Reagent refilling	Automatic filling and discharge (settable in units of minutes)
Dimensions	340W x 190D x 380H (mm) (when the EMP-3 is installed on top) * Seamless
Weight	6.0 kg (including the EMP-3, excluding reagent bottles)

\*Reagent filling/discharge can be automatically set. However, the refilling frequency needs to be adjusted depending on the measured gas humidity and the ambient temperature. Amount of reagent: 6 ml for initial filling, 3 ml for refilling

### Spare parts/Consumables

EMP-3	Spare battery, zero filter, probe filter
WLE-9	Reagent tube, reagent tank, effluent tank, reagent pump, mist catcher, active carbon filter

### Options

Carrying case (for EMP-3 / SGM-9)
Long probe (extendable from approx. 250 to 800 mm)
CK-1 -- Calibration kit
Basic probe (for SGM-9)
Heating transfer line (for SGM-9)

These specifications are subject to change without prior notice.

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