

Thermo Scientific Watson MSS

Mercury Speciation System

The Thermo Scientific™ Watson MSS is a Continuous Emissions Monitoring System that offers high measurement sensitivity and robust operation in harsh environments.

Features

- Measures Total Mercury, Hg^T , as well as reports Mercury Speciation, Hg^0 and Hg^{2+} , for process control and optimization
- Enclosed temperature controlled cabinet ensures reliable low-level mercury measurements with changing ambient conditions
- Large, installed base; 600+ mercury systems installed globally
- Meets US EPA 40CFR75, 40CFR63, and performance specification PS-12A

Complete integrated solution

The Thermo Scientific Watson MSS is a complete, integrated solution that is comprised of an analyzer, optional NIST traceable mercury calibrator, probe controller, probe/converter and umbilical (sample lines).

The simple design results in maximum ease of use, operating costs, high reliability, and easy maintenance.

Model 80i Mercury Analyzer

- Advanced cold vapor atomic fluorescence analysis

Model 81i Mercury Calibrator (optional)

- NIST traceable vapor generator (elemental mercury) performs standard calibration upstream of the inertial filter, with no consumables



- Peltier cooler vapor pressure control and mass flow control regulate mercury output for maximum accuracy

Model 82i Probe Controller

- Controller connects by an umbilical to the stack probe and mercury converter
- Automates key system functions

Model 83i or 85 Mercury Probe

- Consists of a dilution probe and proprietary dry converter
- Conversion at the stack to prevent loss of elemental mercury
- Glass coated components to prevent reactions with mercury

- High flow sample filter to reduce particulate matter contamination
- Automated blow-back clears the filter for trouble-free continuous operation
- The 83i Probe is specifically designed to monitor mercury emissions from environments with high dust, temperature and moisture
- The 85 Mercury Probe is designed to be lightweight and easy to clean

Mercuric Chloride Calibration

- Option to include input connection for hot-vapor mercuric chloride ($HgCl_2$) calibration up stream of the dry converter
- Optional oxidizer added in the probe works with 81i calibrator (optional) to provide a chlorinated mercury standard for calibration in process applications



Thermo Scientific™
Watson MSS

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Fast 5 Advantages



Speciation – Measuring Total and Elemental Mercury and reporting Oxidized Mercury for understanding of process controls for mercury abatement

Lower umbilical temperature – Less energy needed to heat umbilicals to only 70°C as compared to +200°C in other systems

Transport under vacuum – Sample transport under vacuum “freezes” sample chemistry for accurate analysis and eliminates possibility for condensation

Only transport elemental Hg – Eliminate possibility for oxidized mercury to cause bias or error in the sample

Inertial probe for heavy dust loading – 83i Inertial probe can be used upstream at the inlet of process controls where raw process gas has severe particulate loading up to 10g/m³ or higher

Speciation of Hg⁰ and Hg²⁺

The Watson MSS has the capability to measure Hg^T for compliance, as well as both Hg⁰ and Hg²⁺ individually, which is essential for optimal Process Control.

Low temperature Sample Line

As oxides of mercury are already converted into elemental mercury in the probe only elemental mercury is transported. Sample transport occurs at very low pressure (0.1 bar), and samples are diluted with Nitrogen. Extensive testing has proven that a temperature of 70°C is sufficient for sample transport without any issues.

Dry Converter in Stack

Operating at 760°C, the converter disassociates the salts and oxides of mercury to give elemental mercury. This, along with the elemental already passing through, gives the total mercury of the sample. Avoids the potential loss of oxidized mercury in sample line without the need of wet chemistry or a water supply.

Direct Measurement CVAF

The Model 80i Analyzer is based on the principle that Hg atoms absorb ultraviolet (UV) light at 254nm, become excited, then decay back to the ground energy state, emitting (fluorescing) UV light at the same wavelength. CVAF is a measuring principle with high sensitivity and no cross interference from SO₂ present in the sample.

Probe with Inertial Filter

The 83i probe with high flow inertial filter is proven to work in tough stack and process environments. A high-velocity gas flow (20 to 30 m/s) will develop axially through the porous filter tube. From this mainstream flow, a clean sample flow will develop radially through the porous tube wall at a very low face velocity (0.015 m/s), passing into the housing annulus and out the sample tube.

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

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