

# Mercury Stack Gas Monitor SM-4

PROCESS & EMISSIONS MONITORING SYSTEMS

With more than 20 years of experience as a provider of customized solutions in mercury analysis Mercury Instruments were the first to develop an emission monitoring system that uses a dry thermocatalytic method instead of wet chemistry.

The Mercury Stack Gas Monitor SM-4 is ready to meet future measurement standards (Minamata convention & European directives for thermal power plants and incinerators).

Designed for accurate and reliable measurement of very low mercury concentrations in flue gases within complex matrices (SO<sub>2</sub>, NO<sub>x</sub>, HCl, etc.)

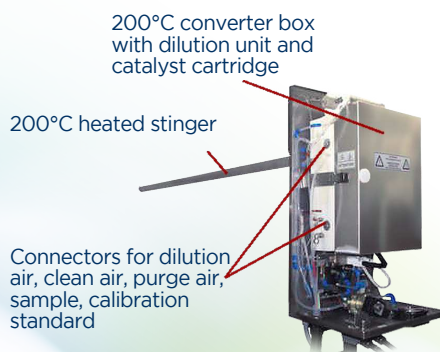


## SPECIFIC FEATURES:

- Sampling line length up to 100 m (300 ft)
- No liquid waste or condensate generated
- Extremely high precision measurement
- Automatic back-flush function
- Continuous measurement of total Hg (elementary, ionic & organic)
- Sample dilution and pre-concentration minimize interference with matrix gases
- Sample conditioning system (probe, dilution unit and low temperature catalytic converter) is entirely heated to avoid mercury adsorption
- Probe converter directly at stack: maintenance-free & no transport of ionic Hg
- Option to install elemental Hg calibration gas generator, NIST traceable, inside analyzer cabinet
- Very low maintenance needed (service interval: ≥ 3 months) - can be automated

## MAIN APPLICATIONS:

- > Coal fired power plants (before & after mercury absorbers)
- > Cement kilns
- > Sulfuric acid production plants
- > Incineration plants (industrial, domestic, medical waste, sewage sludge...)
- > Thermal treatment of contaminated soils, hazardous waste...
- > Metallurgical facilities with potential Hg emissions...



Sample conditioning system

## COMPLIANCE WITH IED, WID & LCPD APPLICATIONS



QAL 1  
EN 14181

QAL 3  
EN 14181

**PRINCIPLE OF OPERATION:**

The heated sample probe along with the sample conditioning system (dilution unit and thermo-catalytic reactor) are mounted at the stack. A maintenance-free ejector pump continuously draws sample gas through the sample conditioning system where the different forms of mercury are converted to the elemental state. Because the catalyst works without wet chemistry at a temperature slightly higher than 200°C, it prevents mercury adsorption while assuring high reliability and low demand for maintenance.

The treated sample is transported through a mildly heated sample line up to 100 metres long to a highly sensitive detector featuring an amalgamation unit (proprietary Mercury Instruments GoldTrap) for pre-concentration. The detector uses Cold Vapor Atomic Absorption Spectrometry (CVAAS) at a wavelength of 253,7 nm.

Both sample dilution and pre-concentration minimize interferences caused by SO<sub>2</sub>, NO<sub>x</sub>, HCl, VOCs etc.

**TECHNICAL SPECIFICATIONS**

Measuring range	0 - 10 / 500 µg/m <sup>3</sup> Hg
Detection limit	0,0001 µg/m <sup>3</sup> (detector) < 0,01 µg/m <sup>3</sup> (system)
Response time	180 - 360 sec t[90]
Temperature range	-5°C to +40°C
Max. sample temperature	250°C
Sample line length	customized: 2 - 100 m
Communication	analogue 4-20 mA RS232
Power supply	230 V / 50 Hz or 110 V / 60Hz
Electrical power consumption	analyzer cabinet: 450 VA probe-converter: 1000 VA heated sample line: 30 VA/m
Dimensions (H x W x D) cm	analyzer cabinet: 161 x 60 x 60 probe box: 36 x 36 x 66 probe controller: 48 x 44 x 27
Weight	analyzer cabinet: 130 kg converter unit: 28 kg probe controller: 14 kg
Air consumption	approx. 16 L/min

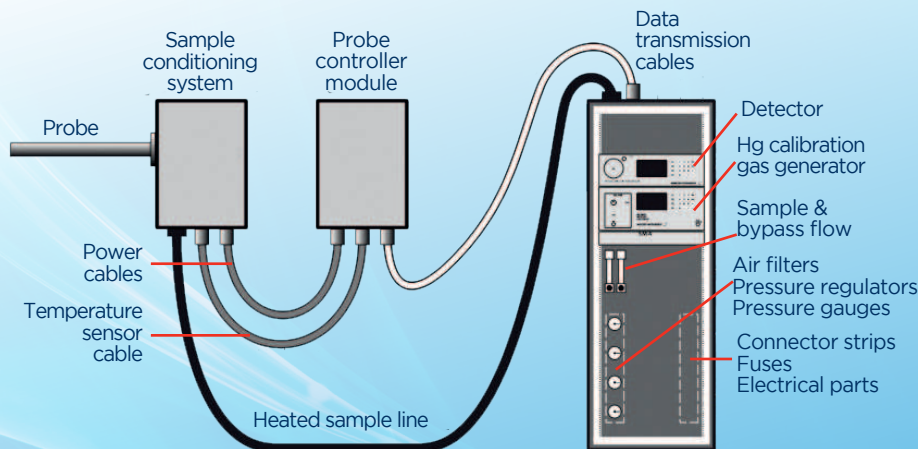


**MAIN OPTIONS:**

- Automatic calibration for elementary & ionic Hg
- Range: 0,05 - 1000 µg/m<sup>3</sup> Hg
- Communication: Modbus RTU/RS485; TCP/IP
- Remote access: modem & SM-4 software
- Calibration: QAL 3 automatic (calibration gas generator for Hg and ionic Hg)

**Turnkey system: components**

- Sample conditioning system with detachable sampling probe
- Sample line (air supply and calibration gas feed lines)
- Probe controller module
- Analysis cabinet with analyzer, mercury calibration gas generator (optional) and electronic components



Product developed and manufactured in Germany by: Mercury Instruments GmbH Analytical Technologies (part of the ENVEA Group).

