Enviro
Technology Services Ltd
part of CuraTerrae

opsis.se


Continuous Emissions Monitoring
and Process Control

# Mercury Monitoring

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# Mercury Monitoring

Waste incinerators, cement plants, and power plants need good and reliable measurements of $Hg^0$ and THg.

The measurement of mercury can be a challenge due to chemical reactions and contamination. The installed systems will often require a lot of maintenance, and still not giving reliable results. The OPSIS DOAS system is different and provides the plants with an accurate analyser that will operate with a minimum of maintenance.

Besides the measurements of $Hg^0$ and THg, the same analyser system can measure a large number of other gases required by legislation, such as $NO_X$, $SO_2$, CO, $CO_2$, $NH_3$, $H_2O$, HF, and HCl.

## RETURN OF INVESTMENT

The cost of investing in an OPSIS system is small compared to the amount of money that is spent on maintaining old and complex extractive systems.

The OPSIS system has low cost of ownership based on few moving parts, long intervals between calibrations, easy operation and low energy consumption.

## TEST AND APPROVALS

The OPSIS system has been tested and approved by a number of internationally recognized institutes and authorities.

The system meets the European directive for waste incinerators and is approved according to EN 15267. The OPSIS system meets the requirements given by U.S. EPA and China EPA among others.

## OPSIS PRODUCT PORTFOLIO

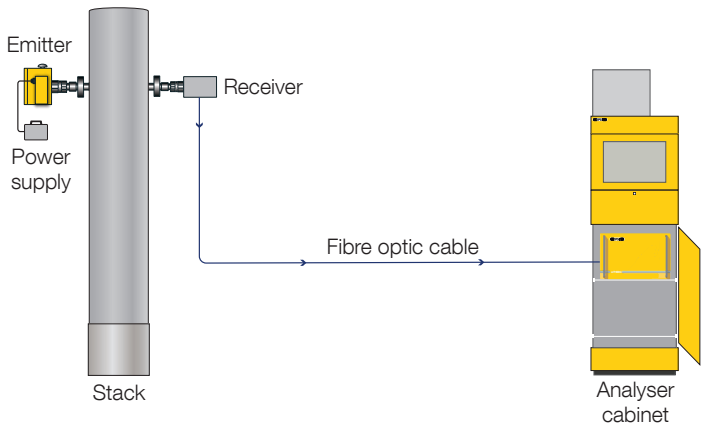
OPSIS has a full product portfolio for measurements of gases in a range of applications. It includes complete CEM systems with reporting, process analysers for raw gas measurements, TDL analysers for $NH_3$, HCl, and $O_2$, oxygen analysers, and Hg analysers.

For further information, please visit www.opsis.se.

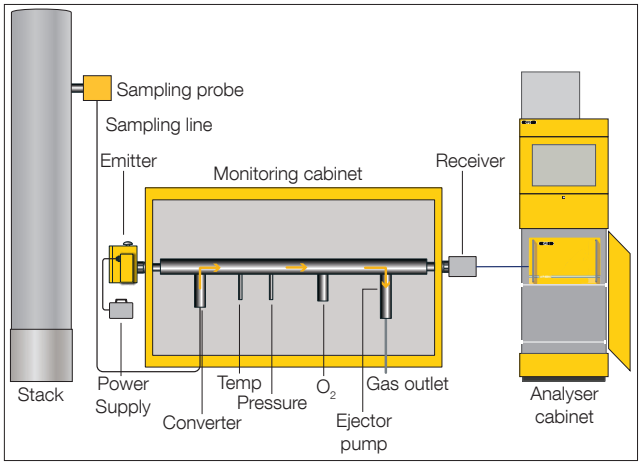
**QAL 1 CERTIFICATION:**
BEST PERFORMANCE
LONGEST CALIBRATION INTERVAL

## SYSTEM OVERVIEW – RAW GAS MONITORING

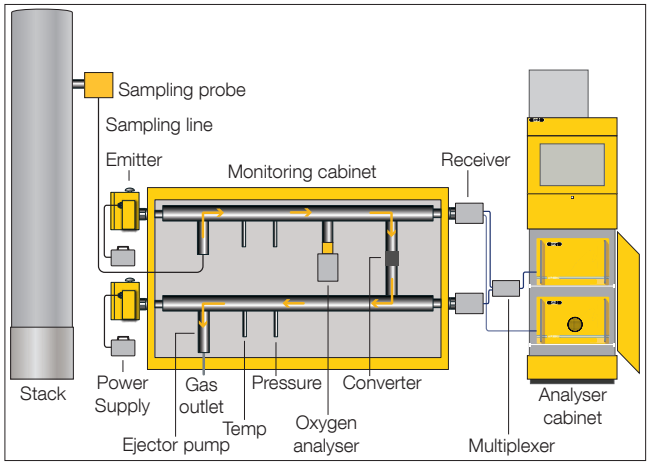
$Hg^0$ monitoring with an OPSIS DOAS system



# SYSTEM OVERVIEW – EMISSIONS MONITORING




Emissions monitoring with OPSIS DOAS system measuring THg




Emissions monitoring with OPSIS DOAS double system measuring THg and all other relevant gases

## PERFORMANCE DATA

(typical data which may vary depending on application)

| Compound | Max. measurement range (1 m path)[1] | Lowest measurement range according to EN 15267 | Min. detectable quantities (monitoring path 1 m, measurement time 30 sec.) |
|---|---|---|---|
| **UV/IR DOAS Analyser Models AR600 / AR602Z / AR602Z/Hg / AR602Z/N / AR602Z/NHg / AR620** | | | |
| $Hg^0$ | 0–1000 µg/m³ | 0–45 µg/m³ | 0.5 µg/m³ |
| THg | 0–1000 µg/m³ | 0–45 µg/m³ | 0.5 µg/m³ |
| NO[2] | 0–2000 mg/m³ | 0–150 mg/m³ | 0.5 mg/m³ |
| $NO_2$ | 0–100% Vol. | 0–20 mg/m³ | 0.5 mg/m³ |
| $SO_2$ | 0–100% Vol. | 0–75 mg/m³ | 0.5 mg/m³ |
| $NH_3$[3] | 0–1000 mg/m³ | 0–10 mg/m³ | 0.5 mg/m³ |
| $H_2O$ | 0–100% Vol. | 0–30% Vol. | 0.1% Vol. |
| HCl | 0–10000 mg/m³ | 0–1000 mg/m³[5] | 10 mg/m³[4] |
| HF | 0–1000 mg/m³ | 0–100 mg/m³[5] | 5 mg/m³ |
| $CO_2$ | 0–100% Vol. | 0–30% Vol.[5] | 0.5% Vol. |
| Benzene | 0–1000 mg/m³ | 0–20 mg/m³[5] | 0.5 mg/m³ |
| **FTIR DOAS Analyser Models AR650 / AR650/N** | | | |
| HCl | 0–100% Vol. | 0–15 mg/m³ | 0.5 mg/m³ |
| CO | 0–100% Vol. | 0–75 mg/m³ | 2 mg/m³ |
| $H_2O$ | 0–100% Vol. | 0–30% Vol. | 0.1% Vol. |
| HF | 0–100% Vol. | 0–1.5 mg/m³ | 0.1 mg/m³ |
| $NH_3$ | 0–100% Vol. | 0–100 mg/m³[5] | 2 mg/m³ |
| $N_2O$ | 0–100% Vol. | 0–500 mg/m³ | 5 mg/m³ |
| $CH_4$ | 0–100% Vol. | 0–20 mg/m³ | 0.5 mg/m³ |
| $CO_2$ | 0–100% Vol. | 0–20% Vol. | 0.1% Vol. |
| **LD500 Laser Diode Gas Analyser** | | | |
| HCl | 0–100% Vol. | 0–15 mg/m³[5] | 0.5 mg/m³ |
| CO | 0–100% Vol. | 0–5% Vol.[5] | 0.1% Vol. |
| $H_2O$ | 0–100% Vol. | 0–30% Vol.[5] | 0.1% Vol. |
| HF | 0–100% Vol. | 0–1.5 mg/m³[5] | 0.1 mg/m³ |
| $NH_3$ | 0–100% Vol. | 0–10 mg/m³[5] | 0.5 mg/m³ |
| $CO_2$ | 0–100 g/m³ | 0–30% Vol.[5] | 0.1% Vol. |
| $O_2$ | 0–21% | 0–20% Vol.[5] | 0.1% Vol. |
| Temperature | 0–1400 °C[5] | — | 5 °C |

**Accuracy**
Better than 2% of measured value or equal to the detection limit (whichever is greater).

**Span drift**
Less than 2% per year.
Please, refer to QAL1 documents.

**Zero drift**
Less than 2% of measurement range per year.
Please, refer to QAL1 documents.

**Linearity error**
Less than 1% of measurement range.

[1] This data refers to a light path of 1 m. For longer paths the maximum range is proportionally smaller. Products are available to create shorter paths in very wide stacks.
[2] Maximum $SO_2$ concentration 5 g/m³ × m.
[3] Maximum $SO_2$ concentration 500 mg/m³ × m.
[4] Monitoring path 5 m, measurement time 30 sec.
[5] Lowest measurement range.

- Recommended monitoring path length: 1 to 5 m.
- After wet scrubbers or when the particulate concentration is high, the monitoring path length may have to be reduced.
- Max. length of fibre optic cable: please refer to product sheets P9 and P16.
- Additional gases can be measured.

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**FACTORY TESTED SYSTEMS
WITH DELIVERY ON TIME.**

# Continuous Emissions Monitoring and Process Control by OPSIS

Easy and reliable construction

Raw-gas monitoring of $Hg^0$ with cross-stack technology

Same system can monitor all other stack gases

Internationally approved

Thousands of systems installed worldwide

Serviced by highly skilled service network

Emissions monitoring of THg

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Please contact Enviro Technology Services to discuss your particular system requirements, including the compounds you wish to monitor. Separate product and other industrial application sheets are available. Specifications subject to change without notice.

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