

Sorbent Trap Monitoring System (STMS) for continuous mercury emission monitoring

PROCESS & EMISSIONS MONITORING SYSTEMS

More than 25 years of experience in continuous sampling of Dioxins and Furans (PCDD/PCDF) with the MCERTs & TÜV certified AMESA system, have benefited to the design of the continuous mercury sampler AMESA-M.

Accurate monitoring of mercury emissions in the $1 \mu\text{g}/\text{m}^3$ range



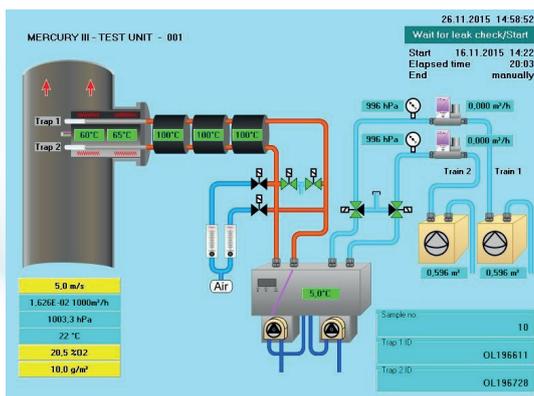
Exists in 2 versions: wall mounted and cabinet

SPECIFIC FEATURES:

- Sorbent Trap Monitoring System (STMS) compliant with the US EPA Performance 12B (30B Test Reference Method) and CEN/TS 17286
- Mercury sampling on a paired adsorbent traps (for QA purposes, as required by US EPA regulations)
- Sample extracted at a proportional rate to the flue gas flow by a heated sample probe
- Fully automated sampling periods from 30 minutes up to 4 weeks
- Integrated display for flow control (pitot tube) - direct measurement of flue gas flow (optional)
- Remote control via Internet or Intranet using a TCP / IP connection
- Easy transfer of operating data protocol via USB memory stick
- Moisture measurement, "dry" correction for the report
- Totally autonomous. Each step can be done directly from the integrated display: it is not necessary to add electronic devices such as a laptop
- All parts of the system are installed and well protected in a cabinet that takes advantage of the many years of experience gained with the AMESA-D dioxin sampler
- Highly reliable system requiring low maintenance

MAIN APPLICATIONS:

- > Power & Combustion
- > Municipal and Hazardous Waste Incinerators
- > Cogeneration and gas turbine
- > Industrial Boilers and Furnaces
- > Glass, Chemical & Petrochemical Plants
- > Cement Kilns



Built-in pitot tube (option) and a thermocouple to sample under volume proportional conditions

Sorbent Trap mercury Monitoring System (STMS) **AMESA-M**

TECHNICAL SPECIFICATIONS

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|---|---|
| Measuring range: (total mercury) | 0.01 - 1000µg/m ³ |
| Sampling period: | from 15 minutes up to 4 weeks |
| Flue gas temperature: | < 200 °C with heated probe > 200 °C on request |
| Max. dust concentration in flue gas: | 20 mg/m ³ |
| Operating temperature: | +5 to +40 °C (optional with air conditioner: -20 to + 55 °C) |
| Max. relative humidity (control cabinet): | 50% |
| Control cycle volume-proportional extraction: | 1 sec |
| Accuracy flue gas velocity measurement: | ±1% of the full scale value |
| Volume measurement accuracy: | ±1.5 % of the measuring range end value |
| Cabinet housing: | - Dimension: (H×W×D) 1850 × 600 × 500mm - Weight: approx. 160kg - Number of heating circuits: 5 max., 2× probe, 3× heated sample gas line |
| Wall-mounted housing: | - Dimension: (H×W×D) 1000 × 800 × 300mm - Weight: approx. 70kg - Number of heating circuits: 3 max, 2× probe, 1× heated sample gas line |

SUPPLY

| | |
|---|---|
| Voltage: | 230V AC, 50Hz (optionally 115V, 50/60Hz) |
| Consumption (without heating circuits): | approx. 0.85kW |
| Fuse: | 20A |
| Instrument air (for optional Pitot tube): | 3 to 7 bar, dry and oil-free |
| Instrument air connection: | hose connection 8×1 or 6×1mm |

PRINCIPLE OF OPERATION:

The **AMESA-M** long-term sampling system is designed to meet the requirements of continuous mercury monitoring applications. This unique system is a development of the proven AMESA D system originally designed to measure micro-pollutants such as dioxins/furans and PCB's in flue gas streams.

The **AMESA-M** consists of a control cabinet and a sample probe assembly. The heated sample probe is equipped with paired Hg-sorbent traps, which extract a sample from the flue gas stream under volume proportional conditions. Gaseous mercury (elemental Hg and oxidized forms of Hg) is collected in the sorbent trap. The traps are placed at the entrance of the sampling probe, which is mounted on the stack or duct. Due to this design, there are no losses in the sampling line upstream of the adsorber.

After flowing through the sampling probe, the extracted sample gas passes through an umbilical to the control cabinet for precise volume determination. The gas passes an electric gas cooler with a Jetstream heat exchanger in which the gas is cooled down to 5°C. The moisture in the gas condenses and is pumped away by a peristaltic pump.

After the gas cooler, the dried gas passes a thermal mass-flow controller which determines and accurately controls the mass flow (kg/s) independent of gas pressure and temperature. It requires no maintenance under normal operating conditions with clean, dry gases. The mass-flow controller is also used to determine the sample gas volume and to correct it to standard conditions.

The system is operated by a touch panel controller. During the sampling the controller stores several sampling data. This data is stored after the sampling period of up to 1 month into the sampling protocol, which could be then copied to other storage devices as e.g. an USB flash drive.

After each sample cycle, the traps are removed for analysis. The analysis is achieved with an onsite analyser or in a certified laboratory. In this way is calculated together with the sampled volume the average Hg concentration over the sampling period. Depending of the mercury concentration of the flue gas and the requested sampling period it is possible to adjust the sample flowrate in such a way, that always enough mercury is collected to determine the mercury emissions, even for concentrations <1µg/Nm³, with high accuracy.

