

MMS

Automatic Monitoring of Mercury in Air and other Gases



- Monitors 2 to 24 Measuring Points Automatically
- Versions for Air, Hydrogen, and other Gases
- Permanent Purging of all Sample Lines
- Ranges from $0.01 \mu\text{g}/\text{m}^3$ to $2000 \mu\text{g}/\text{m}^3$ Hg
- Automatic Calibration Module
- Software for Data Acquisition, Data Visualisation and Storage

Benefits of the MMS Mercury Monitoring System:

- low maintenance demand
- no sensitivity for water vapor
- high stability of calibration
- quick response time

Function

The sample is continuously drawn from each sampling point through special tubing to a heated multiplexer valve unit. One sample at a time is fed into the Mercury Vapor Monitor where the mercury concentration is measured. All sample lines are permanently purged with sample thus minimizing the response time of the system. By this method sample line lengths of 100 m and even more can be employed.

System Design

The MMS system basically comprises a multiplexer-valve unit and a highly accurate and selective mercury detector. A bypass pump maintains a steady flow of sample through the sample filters, sample lines and multiplexer valves. Flow meters with optical alarm sensors guarantee that flow rates are stable. All components are installed inside a protective cabinet. A special version employing the Mercury UltraTracer UT-3000 as detector is available for concentrations in the sub- $\mu\text{g}/\text{m}^3$ range. Options like air conditioning assure reliable function of the system even under extreme climatic conditions.

Data Output

The analyzer unit can be connected to a PC with a serial cable or optionally with a fibre optic cable for operation under harsh industrial conditions.

Modbus or ethernet communication is available.

Stand-alone operation without connecting to a PC is also possible.



MMS: Installation of a 16-channel MMS in a chlor-alkali plant for cellroom monitoring

Applications of the MMS:

Monitoring of mercury in

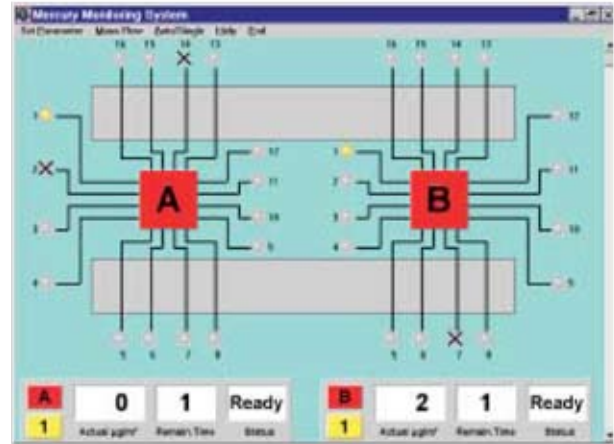
- chlor-alkali plants with mercury cells
- metallurgical industry
- fluorescent lamp production or recycling
- battery recycling plants
- contaminated sites
- natural gas industry
- hydrogen industry

Software

The MMS-Win software allows remote control of the analyzer-multiplexer system via PC. It provides information to the operator such as: mercury concentrations for each sample point, history of measurement results for each sample point, status of the system and calibration information.

Alarm thresholds, duration of measurement for each channel, zero adjustment, specific deactivation of measuring points, can be controlled from the PC.

The operator can interrupt any running measurement and select a sample point for immediate measurement. It is also possible to deactivate any sample point. Emission reports are created automatically and stored as text files and in EXCEL format.



MMS-WIN: customized main screen showing two eight channel systems

Self Diagnosis of the System

The MMS software permanently checks the status of the system. Low flow of bypass stream or sample, plugging up of sample filters and photometer malfunctions are detected by the system and an error message is displayed. An optional calibration module allows automatic calibration checks and re-calibrations of the system. The calibration gas is generated by mercury vapor saturation of air and automatic dilution. The mercury filling of the calibrator is for the whole lifetime of the instrument.

Remote Control of the Analyzer System

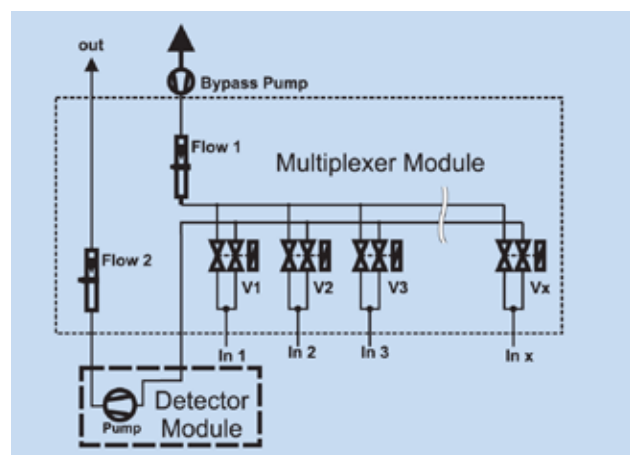
Alarm thresholds, duration of measurement for each channel, zero adjustment, specific deactivation of measuring points, may be controlled from the PC.

Storage of Measuring Data

Measurement data are stored on hard disk as ASCII- and EXCEL files. Filed data can be retrieved at any time as graphic diagrams. A friendly search function enables the user to find quickly data of selected time intervals or data exceeding a threshold value.



MMS Mercury Monitoring System installed at a hydrogen plant



MMS: Sample Gas Flow

Technical Specifications of the MMS

Multiplexer Module:

Number of sampling points:	2 ... 24
Purging of sample lines:	continuously, ca. 40 ... 80 l/h for each channel
Flow control:	Flow meters with alarm sensors for low flow
Heating of valve unit:	approx. 70 °C
Sample line connectors:	fittings for 4 mm i.d./ 6 mm o.d. tubing
Valves:	minimum dead volume
Measuring duration:	45 sec ... 99 minutes, adjustable separately for each channel

Detector:

Measuring principle:	UV absorption at 253,7 nm
Type for standard range:	Mercury-Vapor-Monitor VM-3000
Measuring range (standard):	0.1 to 100 µg/m ³ ; 1 to 1000 µg/m ³ ; 1 to 2000 µg/m ³
Type for low range:	Mercury Ultratracer UT-3000
Measuring range (low range):	0.01 to 50 µg/m ³
Sample flow:	ca. 80 l/h per channel
PC connection:	serial protocol RS 232; connection by cable (optionally by fibre optic cable); modbus RTU; ethernet

Mechanical:

Cabinet:	metal, protection standard IP 55 (NEMA 4X, others as an option)
Dimensions:	from 553 x 600 x 500 mm (WxHxD) to 800 x 2000 x 600 mm; according to channel number and optional equipment (air conditioning)
Weight:	approx. 35 - 175 kg; depending on number of channels and optional equipment

Software:

System requirement:	PC with Windows XP, Vista
Display of measuring data:	actual readings numerically, filed data as time-concentration graphs



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