

## Mercury monitoring system for natural gas MMS-NG

### NATURAL GAS SYSTEMS

The Mercury Monitoring System MMS-NG automatically measures mercury concentrations in natural gas at up to 16 measuring points.

Natural gas often contains mercury at concentrations that vary from below 1 to above 10000  $\mu\text{g}/\text{m}^3$ . Mercury is both toxic and potentially damaging: it can corrode or embrittle common gas plant components. Gas plants reduce mercury in natural gas with mercury removal units (MRUs). MRUs use fixed bed absorbers, often with sulfur-impregnated carbon or other chemisorbents as the active material.

The Mercury Monitoring System MMS-NG is an ideal tool to determine the efficiency of each MRU in real time, and necessary to successfully monitor and control mercury concentrations during natural gas production and processing.

### CUSTOMIZED SOLUTIONS

Each mercury on-line system will differ in sample characteristics as well as installation conditions and operating environment.

Therefore the need for a customized solution!

We have the experience to design systems that fully meet the requirements of your particular mercury monitoring task.

### MAIN APPLICATIONS

- Natural gas platforms
- Natural gas exploitation
- Natural gas processing plants

### SPECIFIC FEATURES

- Automatic and continuous measurement
- Fast and reliable results
- Detects elemental and bound mercury
- Automatic calibration
- Sample point multiplexer: 2 to 16 channels
- Sample dilution for high concentrations
- No carrier gases required
- Certified for hazardous zones



## SAMPLING SYSTEM FOR NATURAL GAS

The integrity of the sampling system is as important as the analyzer itself. To sample natural gas from a pipeline, the sampling system must reduce pressure and guide the sample from the sampling point to the analyzer, leaving the mercury concentration unchanged. Plus it should show a minimum lag time and be suited to use in hazardous zones.

Our MMS sample conditioning system fulfills these requirements. The surface of the pressure-reduction system is electrically heated to obviate condensation and mercury loss caused by the Joule-Thomson cooling effect. A specially coated coalescing filter effectively removes aqueous mist as well as hydrocarbon condensate. Tubing and filter surfaces are specially coated for ultra-low adsorption and constantly conditioned with sample gas. The design allows a maximum input pressure of 240 bar. The output pressure is adjustable from 0.07 to 2 bar.



### TECHNICAL SPECIFICATIONS

#### Multiplexer Module

Number of sampling points:	2 ... 16
Purging of sample lines:	continuously, approx. 40 - 80 l/h for each channel
Measuring duration:	approx. 3 min, separately adjustable for each channel

#### Detector

Measuring principle:	UV absorption (CVAAS), wavelength = 253.7 nm
Principle of preconcentration / matrix effect elimination:	Amalgamation on gold surface, thermal desorption by rapid heating (MI GoldTrap)
Measuring range:	0.001 - 50 µg/m <sup>3</sup> , (with sample dilution system up to 2000 µg/m <sup>3</sup> )
Signal outputs:	<ul style="list-style-type: none"> <li>• analogue: 4-20 mA</li> <li>• serial: RS 232</li> <li>• Modbus RTU RS485 (option)</li> <li>• Ethernet (option)</li> </ul>

#### Sample Conditioning System (SCS)

Max. inlet pressure:	240 bar (3480 psi)
Pressure regulator:	heated, (EEX certified)
Sample wetted surfaces:	coated to minimize Hg adsorption

#### Automatic Calibrator

Operating principle:	Mercury vapor saturation, injection of a constant volume
Calculation of mercury vapor pressure:	according to NIST recommended equation

#### Certification and applied standards

Hazardous zone certification:	ATEX 2G IIC T4 EExp (or equivalent)
Calibration:	<ul style="list-style-type: none"> <li>• ISO/DIS 6978-3</li> <li>• ASTM D 5954</li> <li>• VDI 2267 Part 8</li> <li>• NIST recommendations</li> </ul>
Sampling and mercury determination:	<ul style="list-style-type: none"> <li>• ISO 6978-1</li> <li>• ASTM 5954</li> </ul>

### CALIBRATION

The MMS-NG comes with an Automatic Calibration Unit installed in the analyzer cabinet. It extracts the mercury vapor and injects it into the UT-3000 calibration port by means of a digital syringe.



### OPTIONS

Since every natural gas system is customized and therefore unique, a multitude of options is available.

Among the most common requests for modification are:

- Ex certified enclosures: explosion proof
- Ex certified enclosures: constant purging with pressurized air
- Air conditioned systems
- Manual calibration unit



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