

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 ³ , (with sample dilution system up to 2000 µg/m ³)
Signal outputs:	<ul style="list-style-type: none"> • analogue: 4-20 mA • serial: RS 232 • Modbus RTU RS485 (option) • Ethernet (option)

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"> • ISO/DIS 6978-3 • ASTM D 5954 • VDI 2267 Part 8 • NIST recommendations
Sampling and mercury determination:	<ul style="list-style-type: none"> • ISO 6978-1 • ASTM 5954

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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