

Mercury Ultratracer

AIR QUALITY MONITORING SYSTEMS

The UT-3000 Mercury Ultratracer is a compact and reliable instrument for measuring mercury in gases at ultra trace levels according to the EN 15852. Utilizing the high performance GoldTrap amalgamation module and an optimized state-of-the-art AA-mercury vapor detector the UT-3000 Ultratracer offers detection limits at sub-ng/m³ (ppt - parts per trillion) levels.



SPECIFIC FEATURES:

- Measuring of Total Gaseous Mercury (TGM) in air and other gases such as natural gas, hydrogen, etc. at ultra trace levels
- Well proven detection method: Cold Vapor Atomic Absorption Spectrometry (CVAAS)
- Preconcentration of mercury using the proprietary Mercury Instruments GoldTrap
- Detection limit at sub-ng/m³ (ppq-parts per quadrillion) level, far superior to other instruments on the market
- Offers excellent long-term stability of measurement
- No need for a long optical cell thanks to enhanced sensitivity of the UV-detector in the UT-3000
- High frequency driven electrode-less mercury low pressure lamp as UV light source provides high sensitivity, precision and stability
- Contrary to the fluorescence detection method, the UT-3000 does not require expensive carrier gases
- Insensitive to interferences caused by the quenching effect
- The UT-3000 offers sensitivity and detection limits superior to other mercury analyzers on the market using similar technologies



UT-3000 and the specially designed calibration unit AutoCal (option)

MAIN APPLICATIONS:

- > Continuous outdoor and indoor air quality monitoring
- > Stationary and mobile AQMS laboratories
- > Industrial fence-line and field monitoring
- > Environmental pollution source tracking
- > Studies of mercury dispersion in the atmosphere
- > Mercury monitoring in natural gas or liquefied natural gas (LNG) for quality control
- > Measurement Campaigns and Monitoring Studies...

Mercury Ultratracer UT-3000

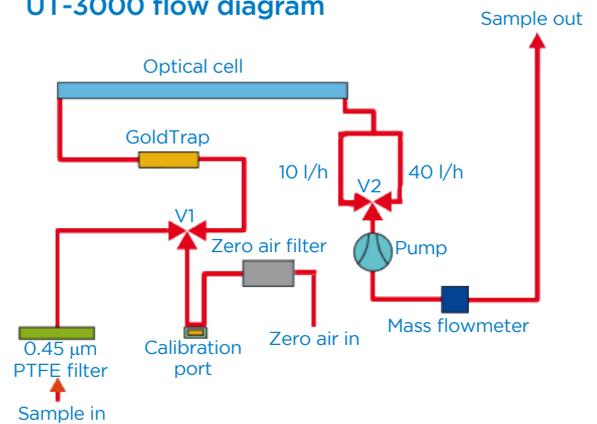
PRINCIPLE OF OPERATION:

After preconcentration on the Mercury Instruments GoldTrap, the sample gas is fed into an optical cell by a maintenance-free membrane pump. A beam of UV light passes through the optical cell; a part of it is absorbed by the mercury atoms present in the sample. This method is called Cold Vapor Atomic Absorption Spectroscopy (CVAAS), an extremely selective and sensitive technology, not prone to interferences and not requiring expensive carrier gases.

The Mercury GoldTrap is a key component of the measuring system. It consists of a wafer-thin ceramic tube with minimum thermal inertia located inside a protective cylinder. Ultra pure, solid gold is used as collecting medium.

The GoldTrap captures the total gaseous mercury (TGM) directly from the gas phase (gold amalgamation). After this accumulation phase the GoldTrap is heated up quickly. The adsorbed mercury is released suddenly (thermal desorption) in gaseous form and swept by an air stream into the optical cell of the detector. The mercury content is measured using Cold Vapor Atomic Absorption Spectrometry (CVAAS) at a wavelength of 253,7 nm.

UT-3000 flow diagram



TECHNICAL SPECIFICATIONS

Measuring principle:	Amalgamation on gold (MI GoldTrap) UV absorption (CVAAS) Wavelength = 253.7 nm
Measurement Range	• 0.1 ng/m ³ - 1,000 ng/m ³ at 10 l sample volume • 1 ng/m ³ - 10,000 ng/m ³ at 1 l sample volume
Detection limit	0.1 ng/m ³ corresponding to 0.5 pg Hg absolutely
UV source	Electrodeless low-pressure mercury lamp (EDL)
Sample volume	0.1 l - 10 l
Sampling duration	9 seconds - 15 minutes
Measurement cycle	3 - 99 min
Sample volume determination	Electronic mass flowmeter (calibrated to 0°C; 1013 mbar)
Sample gas pump	Rotary vane pump
Sample gas filter (at inlet):	Membrane filter PTFE 0.45 µm, exchangeable
Data display	• Real-time signal reading during the heating period; • Measurement results in a bar graph diagram
Outputs	• Analogue 4-20 mA • RS232 / USB
Data storage	Built-in data logger for up to 5,000 measurements
Serial link	RS232
Housing	Rack 19" - 3U
Dimensions (WxDxH)	450 x 350 x 150 mm
Weight	9 kg approx.
Power supply	115 - 230 V, 60/50 Hz
Power consumption	250 VA max (heating peak)
Operating temperature	0°C to +40°C

MAIN OPTIONS:

- AutoRange function (automatic adjustment of the sample volume function of the mercury concentration) for online applications such as PA-2 Gold or natural gas systems
- Manual calibration kit (CalSet)
- AutoCal unit for automatic calibration
- Carrying case with handle and wheels
- Battery power supply module

CALIBRATION:

- Manually: by injecting calibration gas from CalSet into the calibration port
- Automatic: with calibration gas unit AutoCal

Product developed and manufactured in Germany by:

Mercury Instruments GmbH
Analytical Technologies
(part of the ENVEA Group).

